Qatar National Research Strategy

2012

Executive Summary
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 are presented below.

**Vision Statement**

Qatar will be a leading 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

**From Vision to Results**

QNRS 2012 is organized to carry the vision and mission statements logically into goals and objectives that can be implemented and measured.

The 23 goals and 76 objectives address five priority themes, or pillars:

- Enterprise-wide
- Energy and environment
- Computing and information technologies
- Health
- Social sciences, arts and humanities
Ultimately, results and impact will depend on moving research along the innovation value chain, from basic to applied research, then to development and commercialization if applicable, and finally uptake and application.

Implementation and results will require the best efforts of many stakeholders, ultimately working together toward the R&D vision articulated in QNRS 2012 and toward fulfilment of Qatar’s larger vision for human, social, economic and environmental development, as articulated in Qatar National Vision 2030. The specific aims, actors (key stakeholders), early actions, accountability (key performance indicators, KPIs) and challenges for each objective are detailed in the appendixes.

In line with the pace of the country’s development, Qatar’s R&D needs and priorities will evolve. QNRS and the country’s R&D enterprise must be flexible enough to accommodate evolving needs as they emerge. Therefore, QNRS 2012 is a living document and will be reviewed and refreshed annually.
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 and Communication 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 subject 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.
## Qatar National Research Strategy 2012

### Pillar: Enterprise-Wide

#### Planning Area: Governance and Vision

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<thead>
<tr>
<th>Objective EW.1.1: Align research portfolios and investments with QNRS vision, mission and objectives</th>
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<td><strong>Specific Aim</strong></td>
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<tr>
<td><strong>Key Stakeholders</strong></td>
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<td><strong>Actions</strong></td>
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</table>
| Medium term (2–5 years): | Ongoing review of research portfolios across all sectors to
| | • Ensure that research activities are outcome-driven and aligned with the vision
| | • Ensure that research portfolios maintain a dynamic balance across the research chain from basic to applied/ translational to commercialization or policy and services research
| | • Identify gaps in the research portfolio |
| **KPIs** | Immediate (2012–2013): Completion of refined QNRS document Review completed for research entity investment plans Annual Qatar National Research Strategy Forum to be held to review progress toward vision and QNRS Ongoing analysis to feed into forum about the evolution of research against the strategic plan |
| **Challenges** | Need financial resources and human resources for annual forum planning Need financial and human resources for ongoing monitoring |
## Pillar: Enterprise-Wide
### Planning Area: Governance and Vision

**Objective EW.1.2:** Clarify organizational structure, goals and relationships of research entities

| Specific Aim | Transparent and efficient organization and management of research |
| Key Stakeholders | Enablers: QF President for R&D, QF research and development entities, QF administrative departments, QF Capital Projects, QF SPD, HBKU Users: QF research entities, universities and other R&D and funding entities, Sidra, Supreme Education Council |
| Actions | Immediate (2012–2013): Review or develop charters for QF research entities (this can be done in coordination with regular reviews). The charter should specify:  
- vision, mission and goals  
- organizational chart  
- relationships/partnerships with other research entities. Integrate institute charters at the enterprise-level for QF to clarify the R&D governance structure and role delineation |
| Medium term (2–5 years): Review organization of research entities and revisit organization and management of research entities |
| KPIs | Immediate (2012–2013): All QF research entities have a written charter that specifies vision, mission and goals and their relationship with other entities All QF research entities have been reviewed |
| Challenges | Need financial and human resources to conduct operational and medium term reviews |
**Objective EW.2.1:** Develop a process for systematic review and evaluation of QF’s research institutes, QNRF, and QSTP on a regular basis

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>High standards of research and efficient resource allocation</th>
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<tr>
<td>Key Stakeholders</td>
<td>Enablers: QF president for R&amp;D, QSTP, QNRF, QEERI, QCRI, QBRI, DIIFSD, QF Strategy Department</td>
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</table>
| Actions | Immediate (2012–2013): Conduct immediate reviews of QSTP to evaluate  
• institutional mandate, vision, mission, and objectives  
• R&D projects and programs  
Conduct an immediate review of QNRF to evaluate  
• institutional mandate, vision, mission, and objectives  
• funding priorities, processes, and procedures  
Using the QNRS 2012 evaluation framework, further develop indicators to underpin review and evaluation of research institutes and other QF research entities  
Develop a systematic plan for evaluation and review of research institutes and other QF research entities  
Commission a baseline study of research institutes on which to ground future evaluations |
| Medium term (2–5 years): Initial review of all existing QF research entities |
| KPIs | Immediate (2012–2013): Process in place for review and evaluation  
Developed indicators for future evaluations  
Baseline studies commissioned |
| Challenges | Need capabilities and capacity to monitor evolving environment that may force changes to the review criteria and processes over time  
Need financial and human resources to commission, conduct, and manage evaluation process |
<table>
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<tr>
<th>Specific Aim</th>
<th>Develop capability to track and report on research activity in Qatar</th>
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<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Enablers: QF president for R&amp;D, QSTP, QNRF, QEERI, QCRI, QBRI, DIIFSD, QF Strategy Department, QScience.com, QSA</td>
</tr>
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</table>
| Actions | Immediate (2012–2013):  
Conduct conversations with QSA to synchronize planning for this  
Initiate discussions with appropriate research entities and appropriate regional bodies  
Develop metrics and data indices for research activity |
| Medium term (2–5 years):  
Implement initial plans to harmonize metrics  
Establish observatory |
| KPIs | Immediate (2012–2013):  
Initial set of metrics and data indices developed  
Implementation plan for national observatory developed |
| Challenges | Need financial and human resources to commission to design and implement the national observatory |
### Pillar: Enterprise-Wide

**Planning Area:** R&D Ecosystem  
**Objective EW.3.1:** Improve purchasing and procurement processes for research needs

<table>
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<tr>
<th>Specific Aim</th>
<th>Improve the efficiency of research through timelier access to research materials</th>
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</table>
| Key Stakeholders | Enablers: QF president for R&D, QF Procurement, MoI (Customs), MoE, Customs Authority, SCH, QF HSSE  
Users: Universities, research institutes, HMC, Sidra, and private-sector laboratories |
| Actions | Immediate (2012–2013):  
Identify good practice globally.  
Conduct micro-level (QF internal) study to  
• review current purchasing and procurement processes  
• identify specific purchasing and procurement issues  
• present options and recommendations for improving and streamlining purchasing and procurement for the research community.  
Coordinate with government stakeholders to conduct a macro-level (nationwide) study to  
• identify customs issues that delay or prohibit acquisition of research materials  
• review existing legislation  
Present options and recommendations for improving and streamlining processes.  
Medium term (2–5 years):  
Implement improved processes |
| KPIs | Immediate (2012–2013):  
Completed studies and recommendation to identify options for improving procurement and purchasing  
New or revised QF policies on purchasing and procurement |
| Challenges | Macro-level initiatives may require high-level government support and new legislation  
Need financial and human resources to conduct ongoing discussions and negotiations about required change |
**Pillar: Enterprise-Wide**

**Planning Area: R&D Ecosystem**

**Objective EW.3.2:** Improve the management of IP assets emerging from Qatar’s research entities

<table>
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<tr>
<th>Specific Aim</th>
<th>Strategic and efficient IP management</th>
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</table>
| Key Stakeholders | Enablers: QF president for R&D, QF legal, QSTP, Ministry of Justice, MoBT, Chamber of Commerce and Industry, QF, universities, and research entities  
Users: QF research entities, QSTP, universities and other R&D entities |
| Actions | Immediate (2012–2013):  
Conduct a thorough review of current IP laws and practices in QF and nationally to identify  
- relevant institutions  
- issues and gaps  
- opportunities to streamline or centralize IP management system  
Based on recommended actions, develop an implementation and evaluation plan  
Medium term (2–5 years):  
Implement plan |
| KPIs | Immediate (2012–2013):  
IP study completed  
Processes and timeline in place for new and improved IP management system |
| Challenges | Need financial and human resources to conduct review and implementation of a new IP management system |
### Objective EW.3.3: Create and implement appropriate policies to ensure that research methods meet global standards

#### Specific Aim
High standards for research based in Qatar and improved protection for researchers and research subjects.

#### Key Stakeholders
- **Enablers:** QF president for R&D, MoE Measures and Standards Department, SCH, QF legal department, QSA, QF research entities, universities and other R&D entities (initial support), Civil Defense
- **Users:** QF research entities, universities, and other R&D entities

#### Actions
- **Immediate (2012–2013):**
  - Conduct a review of existing policies and standards for research to understand gaps (e.g., human subject protection, requirements for use and disposal of biological or hazardous research materials, laboratory safety and certifications)
  - Clarify responsibilities for enforcing policies and regulations
  - Identify international best practices
  - Develop a code of conduct for research in QF as a model for the country
  - Document research policies and recommendations

- **Medium term (2–5 years):**
  - Implement codes for research standards

#### KPIs
- **KPIs Immediate (2012–2013):**
  - Completed review of existing policies and standards
  - Completed review of international best practices
  - Completed draft code of conduct produced for research in QF
  - Implementation of research standard codes

#### Challenges
Need financial and human resources to conduct reviews.
### Pillar: Enterprise-Wide

#### Planning Area: R&D Ecosystem

**Objective EW.3.4:** Promote a vibrant research culture through communication and outreach activities

<table>
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<tr>
<th>Specific Aim</th>
<th>High standards of research and efficient resource allocation</th>
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<tr>
<td>Key Stakeholders</td>
<td>Enablers: QF president for R&amp;D, QF Communications Department, SEC, QRIs, QSTP, QNRF, community-based and professional associations, Al Jazeera, other government and industry</td>
</tr>
</tbody>
</table>
| Actions | **Immediate (2012–2013):**  
Design a primary and secondary school program to inspire student interest in science  
Develop a national Excellence in Science lecture series and bring in top scientists to give public lectures  
Develop an outreach and communication plan that includes engagement with  
- Al Jazeera to make sure that science, research, and innovation are covered in the media  
- research entities to plan outreach activities  
- civic organizations (e.g., scientific academies and associations) to coordinate and promote research culture in the community |
| Medium term (2–5 years): | Develop metrics to evaluate impact of outreach activities. |
| **KPIs** | **Immediate (2012–2013):**  
Primary and secondary school program launched  
Lecture series launched  
Outreach and communication plan developed |
<p>| Challenges | Need financial and human resources to support lecture series and to manage a communication and outreach program |</p>
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<th>Pillar: Enterprise-Wide</th>
<th>Planning Area: Capacity, Workforce, and Education</th>
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<tr>
<td><strong>Objective EW.4.1:</strong></td>
<td><strong>Draft and implement a comprehensive National Research Human Resource Plan for the next 5–10 years</strong></td>
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**Specific Aim**
Build an adequate supply of expertise to fulfill QNRS objectives

**Key Stakeholders**
- Enablers: MoI, Amiri Diwan, QF leadership, SEC
- Users or beneficiaries: QEERI, QBRI, QCRI, QSTP, universities and other public and private research entities

**Actions**
**Immediate (2012–2013):**
- Initiate a National Research Human Resource study to identify
  - current research workforce supply and demand in fields of research
  - planned research workforce demand
  - gaps in the supply for current and planned research needs
  - barriers to recruiting, retaining, and developing an adequate research workforce
- Identify different employment contract mechanisms.
- Review existing models of capacity building in various constituencies.
- Identify policy actions to address gaps and barriers, including
  - employment, immigration, and residency policies for recruitment and retention of researchers
  - options to incentivize Qatars and develop and retain local capacity in research
  - development of a balanced mix of world-renowned researchers, outstanding protégés, research assistants, postdocs, and lab technicians
  - development or enhancement of local education and training programs
  - support for an appropriate mix of degree attainment from programs within Qatar and internationally

**Medium term (2–5 years):**
Implement policy actions to attract and develop human resources for R&D.

**KPIs**
**Immediate (2012–2013):**
Completion of studies associated with national research human resource plan

**Challenges**
- Need financial and human resources to conduct the study
- Need research entities to be able to define portfolio and needs for the next 5–10 years
- Need to develop data and survey instruments to build information on the research workforce
### Objective EW.4.2: Strengthen K–12 and undergraduate programs in the fundamental sciences and mathematics

<table>
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<tr>
<th>Specific Aim</th>
<th>Support for current research in Qatar and future supply of researchers</th>
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<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Enablers: QF leadership, Education City universities, QU, CNA-Q, SEC, other government entities</td>
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<tr>
<td>Users or beneficiaries: Qatar employers</td>
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<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Review existing courses and programs in fundamental sciences and mathematics to identify supply, demand, and gaps in course and degree offerings</td>
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<td>Conduct surveys with student populations to understand preferences for degree programs</td>
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<td>Identify options to create, support, or enhance undergraduate courses and degree programs in the fundamental sciences and mathematics</td>
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<td>Review international good practices and programs and recommend appropriate actions for Qatar</td>
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<td>Conduct study into the supply and demand issues (interest and performance issues) and develop options and recommendations</td>
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<td>Review and develop incentives and communication to encourage and stimulate national interest</td>
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<td>Medium term (2–5 years):</td>
<td>Implement recommended actions based on outcomes of studies</td>
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<td>Implement the ETSS Project 10.2 to improve the national curriculum (SEC)</td>
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<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Completion of gap analysis</td>
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<td>Completed survey and analysis of student preferences</td>
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<tr>
<td>Challenges</td>
<td>Lack of demand for undergraduate courses and degrees in fundamental sciences and mathematics</td>
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<tr>
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<td>Need human and financial resource to establish undergraduate courses</td>
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<td>Pillar: Enterprise-Wide</td>
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<td>Planning Area: Capacity, Workforce, and Education</td>
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<tr>
<td><strong>Objective EW.4.3: Enhance and create new graduate programs in areas of national interest</strong></td>
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**Specific Aim**  
Provide a sustainable pipeline of graduate students in areas that support the QNRS

**Key Stakeholders**  
Enablers: HBKU, QF leadership, QU, Education City universities, and CNA-Q  
Users: QEERI, QBRI, QCRI, QSTP, and other public and private research entities

**Actions**  
Immediate (2012–2013):  
Complete National Research Human Resource Plan to identify priority areas for core skill development and undergraduate and graduate academic program needs (path dependent)

Medium term (2–5 years):  
Complete feasibility studies for programs based on attendance projections.  
Determine what programs can be supported by existing universities and branch campuses and which graduate programs may require new partnerships  
Implement ETSS project 16.1 (increase the proportion of students graduating from quality-assured higher education programs linked to the needs of the knowledge based economy [SEC])  
Create postdoctoral opportunities for newly qualified, young scientists in areas of national interest

**KPIs**  
Immediate (2012–2013):  
Completion of National Research Human Resource Plan

**Challenges**  
Need human resources for instruction of graduate courses
### Pillar: Enterprise-Wide

#### Planning Area: Partnerships

**Objective 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

<table>
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<tr>
<th>Specific Aim</th>
<th>Encourage knowledge sharing, collaboration, and cooperation</th>
</tr>
</thead>
</table>
| Key Stakeholders | Enablers: QF leadership, QNRF, QSTP, QRIs  
Users: Government, academia, industry, research institutes, and other members of the R&D community |
| Actions | Immediate (2012–2013):  
Form an EW working group to identify the challenges in the formation of partnerships locally and internationally  
Develop a white paper that identifies  
- lessons learned from international models of collaboration and applications in the Qatar context  
- legal, bureaucratic, human resource, or funding barriers to collaboration  
- explore options for resource sharing (e.g., secondments, joint hires)  
- options to incentivize or remove barriers to collaboration and integration between academic, private, and public components of the research enterprise  
- mechanisms to facilitate hand-off from research endpoint of one institution into subsequent phases by other institutions (e.g., policy to any phase, basic to translational, translational to applied; consider grand-challenge mechanism for robust research through these types and phases) |
| Medium term (2–5 years): | Implement recommendations from above reviews |

| KPIs | Immediate (2012–2013):  
Formation and meeting of EW working group  
Development of a white paper on research collaboration and integration |
| Challenges | Commitment from research entities for collaboration  
Need financial and human resources to manage reviews and studies  
Need financial and human resources to implement actions and policies |
APPENDIX B: Energy and Environment Aims, Actors, Actions, Accountability and Challenges
### Pillar: Energy and Environment

#### Planning Area: Oil and Gas

**Objective EE.1.1:** Develop the knowledge base and technology required to enhance the recovery and processing of Qatar’s petroleum and natural gas resources

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Responsible exploitation of hydrocarbon resources, long-term maintenance of strategic reserves</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: QP and subsidiaries, QEERI, Texas A&M University at Qatar, QU, QCRI, QSTP, Shell, QMIC  
Enablers: Funding entities  
Users or beneficiaries: QP and subsidiaries  
Regulator: MoEI |
| Actions | Immediate (2012–2013)  
Develop a coordinated multiyear R&D plan |
| | Medium term (2–5 years)  
Conduct research directed at improved reservoir management  
Evaluate and, if appropriate, test enhanced oil recovery methods, including carbon dioxide injection  
Develop improved technology for the efficient and safe processing of petroleum and natural gas and the handling and transport of the products thereof  
Develop and implement advanced and integrated database systems with high-end visualization and communication tools for reliable efficient and reliable oil and gas information (QCRI)  
Develop and implement instrumentation and automated systems (with multiple and diverse sensing capabilities and actuation) for monitoring, predicting, and controlling processes associated with exploration and production of gas and oil (QCRI)  
Develop advanced multiphysics multiscale modeling and visualization technologies (QCRI) |
| KPIs | Immediate (2012–2013):  
Completion of a coordinated multiyear R&D plan |
| Challenges | Need to ensure continuity of support for ongoing efforts  
Enhance university capabilities in basic geosciences |
Pillar: Energy and Environment

<table>
<thead>
<tr>
<th>Planning Area: Oil and Gas</th>
<th><strong>Objective EE.1.2:</strong> Establish a basic and applied research program in natural gas conversion to higher-value products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aim</strong></td>
<td>Economic diversification; optimal exploitation of hydrocarbon resources in new markets</td>
</tr>
</tbody>
</table>
| **Key Stakeholders**       | Researchers and developers: QP, QU, QEERI, QSTP, Texas A&M University at Qatar  
Enablers: Funding entities  
Users or beneficiaries: QP and subsidiaries  
Regulator: MoEI |
| **Actions**                | Immediate (2012–2013): Develop a coordinated multiyear R&D plan  
Medium term (2–5 years):  
Conduct applied research and technology development and testing directed at the conversion of natural gas to transportation fuels and chemicals  
Conduct basic research directed at high-payoff approaches for converting natural gas to high-value products.  
Develop advanced modeling and simulation tools in thermodynamics, kinetics, and transport phenomena for design, fabrication, and testing of reactors, multifunctional membranes, and catalysts (QCRI) |
| **KPIs**                   | Immediate (2012–2013): Completion of a coordinated multiyear R&D plan |
| **Challenges**             | Maintaining a balance between basic and applied applications  
Importance of building on current QP and QU capabilities |
<table>
<thead>
<tr>
<th>Planning Area: Oil and Gas</th>
<th><strong>Objective EE.1.3:</strong> Develop technologies that offer to expand the global market for natural gas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aim</strong></td>
<td>Expand the global demand for natural gas</td>
</tr>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Researchers and developers: QP and subsidiaries, QEERI, Texas A&amp;M University at Qatar, QU, QSTP, HBKU, GORD</td>
</tr>
<tr>
<td></td>
<td>Users or beneficiaries: Multiple, including within and external to Qatar, QP, and subsidiaries</td>
</tr>
<tr>
<td></td>
<td>Regulator: MoEI</td>
</tr>
<tr>
<td><strong>Actions</strong></td>
<td>Immediate (2012–2013):</td>
</tr>
<tr>
<td></td>
<td>Conduct an evaluation of near- and mid-term technologies that offer to increase global demand for natural gas. Applications include transportation, cooling, and hybrid natural gas/renewable systems</td>
</tr>
<tr>
<td></td>
<td>Conduct economic research directed at understanding the drivers of the global LNG market in light of potential new sources of natural gas supplies</td>
</tr>
<tr>
<td></td>
<td>Determine the benefits and costs of research directed at new applications of natural gas</td>
</tr>
<tr>
<td></td>
<td>Medium term (2–5 years):</td>
</tr>
<tr>
<td></td>
<td>Implement research program (if and when technology evaluation and market assessment recommends)</td>
</tr>
<tr>
<td><strong>KPIs</strong></td>
<td>Immediate (2012–2013):</td>
</tr>
<tr>
<td></td>
<td>Technology evaluation completed, market assessment completed</td>
</tr>
<tr>
<td></td>
<td>Decision whether to implement a research program in this area</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>Need to coordinate or partner with extensive international efforts</td>
</tr>
</tbody>
</table>
### Pillar: Energy and Environment

#### Planning Area: Renewable Energy

**Objective EE.2.1:** Create and implement a comprehensive solar energy research program to include solar electric and solar thermal applications

| Specific Aim | Economic diversification through the development of solar energy products, processes and applications |
| Key Stakeholders | Researchers and developers: QEERI, QNFSP, GORD, Texas A&M University at Qatar, CNA-Q, QU, QCRI, QP and subsidiaries, QSTP private companies (e.g., Chevron, GreenGulf, Qatar Solar Technologies). Enablers: Funding entities Users or beneficiaries: QP and subsidiaries, MoE, Green Building Council, Qatar 2022, Kahramaa Regulator: MoEI, MoE |
| Actions | Immediate (2012–2013): Assist the MoEI in its examination of the viability of renewable energy in Qatar, as called for in the QNDS (2011–2016) Measure and assess solar resources in Qatar for solar electric and thermal applications Develop a coordinated multiyear R&D plan for creating a solar energy research program in Qatar covering solar electric, solar thermal, and hybrid solar/natural gas technologies. This activity includes test stations and basic research, including electrochemistry Medium term (2–5 years): Implement a coordinated solar energy research program Explore advanced computing methods (hardware and software, scalability of codes) to facilitate paths toward exascale computing (QCRI) Develop efficient new and improved mathematical methods and computational tools, which are crucial for solar energy and other fields (including solar energy cell design, combustion efficiency, materials science, photovoltaic materials, nanoscience, and nanoelectronics) (QCRI) Develop computation methods and tools for integrating performance engineering in existing or new simulation codes, with advanced optimization methods (QCRI) |
| KPIs | Immediate (2012–2013): Provision of timely assistance to the MoEI Completion of measurement and assessment project Completion of a coordinated multiyear R&D plan |
| Challenges | Need to be aware of extensive international efforts and focus on Qatar-specific problems Need to ensure a proper balance between longer-term development and pressure for early deployment |
### Pillar: Energy and Environment

#### Planning Area: Renewable Energy

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Economic diversification through the development of alternative fuels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: QEERI, QU, QNFSP, GORD, Texas A&amp;M University at Qatar, QU, QSTP, QCRI, private companies (e.g., ExxonMobil) Enablers: Funding entities Users or beneficiaries: MoEI, MoE Regulator: MoEI, MoE</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Conduct further discussions to establish the feasibility of carbon dioxide conversion using biological or biochemical processes. Develop a coordinated multiyear R&amp;D plan Maintain awareness of international research directed at fuel production via algal, microbial, or biochemical approaches Medium term (2–5 years): Conduct basic and applied research directed at developing technologies to convert carbon dioxide to fuel Conduct basic and applied research directed at developing technologies to convert waste to energy Conduct basic and applied research directed at developing commercially viable approaches for producing chemicals from sunlight and carbon dioxide via algal, microbial, or biochemical approaches that are appropriate for application in Qatar (i.e., minimal use of freshwater or appropriate for saltwater) Explore advanced computing methods (hardware and software, scalability of codes) to facilitate paths toward exascale computing (QCRI) Develop computation methods and tools for integrating performance engineering in existing or new simulation codes, with advanced optimization methods (QCRI)</td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Completion of a coordinated 5-year R&amp;D plan</td>
</tr>
<tr>
<td>Challenges</td>
<td>Obtaining research personnel experienced in underlying core disciplines (e.g., genetic engineering of algae)</td>
</tr>
</tbody>
</table>
### Pillar: Energy and Environment

<table>
<thead>
<tr>
<th>Planning Area: Energy Efficiency</th>
<th>Specific Aim</th>
<th>Key Stakeholders (Interface with Social Sciences, Arts and Humanities/Behavioral Research)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective EE.3.1:</strong> Improve the efficiency of energy use in Qatar, with special emphasis on reducing GHG emissions. <strong>Note:</strong> Strongly supports planning area EE.6</td>
<td>Responsible use of natural resources and reduction of Qatar’s carbon footprint</td>
<td>Researchers and developers: QEERI, GORD, Texas A&amp;M University at Qatar, CNA-Q, QU, QCRI, CMUQ, VCUQatar, HEC Paris in Qatar, QSTP, Mowasalat (Karwa), GreenGulf, QP, and subsidiaries</td>
</tr>
</tbody>
</table>

**Enablers:** Funding entities

**Users or beneficiaries:** MoEI, MoE, MMUP, Green Building Council, Qatar 2022, Kahramaa, GORD, Public Works Authority (Ashghal), Qatar Rail, QP and subsidiaries, Qatar’s major industries, and Mowasalat (Karwa)

**Regulator:** MoEI, MoE, MMUP, Kahramaa

<table>
<thead>
<tr>
<th>Actions</th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Develop a coordinated multiyear R&amp;D plan</td>
</tr>
<tr>
<td></td>
<td>Provide in-depth technical expertise and policy research in support of government decision-making regarding investments, standards, and regulations aimed at improving the efficiency of energy use</td>
</tr>
<tr>
<td></td>
<td>Conduct research directed at improving energy efficiency in Qatar, including engineering solutions, behavioral analyses, and policy research</td>
</tr>
</tbody>
</table>

**Medium term (2–5 years):**

| | Investigate potential of smart grid technologies to improve efficiency. |
| | Develop instrumentation and communication and ICT in the built environment and other environments crucial to Qatar’s economy (QCRI) |

<table>
<thead>
<tr>
<th>KPIS</th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Completion of a coordinated multiyear R&amp;D plan</td>
</tr>
<tr>
<td></td>
<td>Provision of timely assistance to standard-setting and regulatory organizations</td>
</tr>
<tr>
<td></td>
<td>Completion of research identifying viable, cost-effective opportunities to improve energy efficiency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Need to be aware of extensive international efforts and focus on Qatar-specific problems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Need to develop interdisciplinary teams, likely cutting across institutional lines</td>
</tr>
<tr>
<td></td>
<td>Need close coordination with users</td>
</tr>
</tbody>
</table>
### Pillar: Energy and Environment

#### Planning Area: Understand and Protect the Natural Environment

<table>
<thead>
<tr>
<th>Objective EE.4.1: Understand and, where appropriate, restore Qatar's marine and terrestrial natural resources</th>
</tr>
</thead>
</table>

| Specific Aim | Maintain and restore Qatar’s biodiversity |
| Key Stakeholders | Researchers and developers: MoE, QEERI, QSTP, QCRI, QU, QP and subsidiaries, Ras Laffan Industrial City, CNA-Q, QCRI, VCUQatar, CMUQ, WCMC-Q, ExxonMobil, Maersk, Qatar Museums Authority, Amiri Diwan, QMIC |
| Enablers: Funding entities | Users or beneficiaries: MoE, MoEI, QP and subsidiaries, industrial cities, QNFSP |
| Regulator: MoE | |

#### Actions

**Immediate (2012–2013):**
- Develop a coordinated multiyear R&D plan
- Continue research and cataloging effort directed at marine and terrestrial ecosystems, natural resources, soil, and biodiversity in Qatar
- Provide technical expertise, technical assessments, and policy research to the MoE in designing and establishing a comprehensive electronic biodiversity database (QNDS mandate)
- Promote public awareness of the importance of biodiversity and ecosystem protection

**Medium term (2–5 years):**
- Conduct research required to expand actively managed protected areas (QNDS mandate)
- Create a biodiversity research program emphasizing improved understanding in support of managing, protecting, and restoring Qatar’s natural resources, including inland deserts, coastal areas, and marine resources
- Conduct research appropriate to multinational agreements on sustainable fisheries
- Develop instrumentation, modeling, simulations, and predictive and visualization platforms indicating the state of critical environments (such as marine) in real time (QCRI)

#### KPIs

**Immediate (2012–2013):**
- Completion of a coordinated multiyear research plan
- Completion of biodiversity/natural resource research catalog
- Provision of timely assistance to the MoE and evidence of a major role by the research community in establishing the biodiversity database

#### Challenges

- Need to coordinate with neighboring nations in understanding cross-boundary biodiversity issues
- Requirement to attract appropriate specialists for extended research time in Qatar
## Pillar: Energy and Environment

### Planning Area: Understand and Protect the Natural Environment

**Objective EE.4.2:** Understand and, where appropriate, restore Qatar’s natural resources. Develop more-efficient approaches to agriculture within Qatar

| Specific Aim | Understand and improve water and food security in arid climates. |
| Key Stakeholders | Researchers and developers: MoE, QEERI, QU, QSTP, QCRI, Texas A&M University at Qatar, Northwestern University in Qatar, HEC Paris in Qatar, QP and subsidiaries, industrial cities, CNA-Q, QCRI, VCUQatar, QSA, Shell Research Center, ExxonMobil Research Center, ConocoPhillips Research Center, Kahramaa  
Enablers: Funding entities  
Users or beneficiaries: MoE, QNFSP, QEERI, GORD, SCH, private sector (e.g., Al Sulaiteen Complex), Kahramaa  
Regulator: MoE, SCH |
| Actions | Immediate (2012–2013):  
Develop a coordinated multiyear plan for construction of a multiscale hydrogeological model of Qatar  
Develop a coordinated multiyear plan for research on water cultivation  
Create a basic and applied research program on water reuse  
Initiate a research project to explore the feasibility of sustainable vertical farming using advanced techniques for water reclamation and space-efficient cultivation  
Conduct socioeconomic impact assessment studies  
Medium term (2–5 years):  
Develop a dynamic multi scale soil-plant-atmosphere water model of the desert environment in Qatar  
Develop a model to track the resource and policy relationships between water, energy, and food in Qatar  
Explore feasibility of new greenhouse technologies  
Explore feasibility of hydroponic and aeroponic technologies  
Conduct research on soil and ground reclamation  
Identify commercial opportunities for agriculture technologies or innovations (e.g. date palm genome sequencing) |
| KPIs | Immediate (2012–2013):  
Completion of a coordinated multiyear plan for construction of a multi scale hydrogeological model of Qatar  
Completion of a coordinated multiyear plan for research on water cultivation  
Completion of an analytic framework capable of tracking the collective environmental and socioeconomic impact of energy, food, water policies  
Delivery of a research report on the feasibility of sustainable vertical farming  
Number of students involved in immediate actions |
| Challenges | Need to attract and maintain a multidisciplinary team of experts covering the fundamental sciences, computer modeling, and the applied social sciences |
### Pillar: Energy and Environment

**Planning Area:** Environmental Sustainability

**Objective EE.5.1 (Cross-Sector Program):** Conduct research to identify and understand potential adverse impacts of air, water, and food quality in Qatar on health. On the health side, see planning area HE.1.12

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Improve environmental health</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: Sidra, QEERI, QCRI, Weill-Cornell Medical College, MoE, QBRI, HMC, QSA, QU, QMIC, Total, Texas A&M University at Qatar  
Enablers: Funding entities  
Users or beneficiaries: MoE, SCH, MoEI, MMUP, industrial cities, QP and subsidiaries  
Regulator: MoE, SCH, Kahramaa |
| Actions | Immediate (2012–2013):  
Conduct a preliminary assessment of health risks associated with heat, air, water, and food quality in Qatar  
Develop a multiyear research plan based on the preliminary assessment  
This plan would include data collection, analysis, and experimental research on health effects  
Medium term (2–5 years):  
Conduct research on the health impacts of air quality in Qatar, focusing initially on ozone and particulate matter in Doha, including outdoor and indoor air pollution levels  
Develop instrumentation, modeling, simulations, and predictive and visualization platforms indicating the state of the environment in real time (accessible by any resident or visitor to Qatar) (QCRI)  
Develop a historical database for all environmental health information recorded (QCRI) |
| KPIs | Immediate (2012–2013):  
Completion of preliminary assessment of environmental health risks  
Completion of a coordinated multiyear research plan |
<p>| Challenges | Requirements to develop and cross-sector research plan and program |</p>
<table>
<thead>
<tr>
<th>Planning Area: Environmental Sustainability</th>
<th><strong>Objective EE.5.2:</strong> Conduct research needed to ensure that Qatar's population is protected from the adverse impacts of air pollution. On the health side, see planning area HE.1.12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Aim</td>
<td>Improve air quality and air quality management</td>
</tr>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: MoE, QEERI, QU, QSTP, QCRI, Texas A&amp;M University at Qatar, Northwestern University in Qatar, HEC Paris in Qatar, QP and subsidiaries, CNA-Q, QCRI, VCUQatar, QSA, Total, QMIC</td>
</tr>
<tr>
<td>Enablers: Funding entities</td>
<td>Users or beneficiaries: MoE, MoEI, QP and subsidiaries, GORD, SCH</td>
</tr>
<tr>
<td>Regulator: MoE, SCH, MoEI</td>
<td></td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Establish protocols for and implement an outdoor and indoor air quality monitoring program that develops data required for scientific analysis of health impacts Based on available air quality information, develop a multiyear research plan Examine the technical options for improving indoor air quality in Qatar</td>
</tr>
<tr>
<td>Medium term (2–5 years):</td>
<td>Use data from the air quality monitoring program to build an R&amp;D program Develop instrumentation, modeling, simulations, and predictive and visualization platforms indicating the state of the environment in real time (accessible by any residents or visitor to Qatar) (QCRI) Develop an air database for all information recorded and history (QCRI)</td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Air quality monitoring program in place</td>
</tr>
<tr>
<td>Challenges</td>
<td>Personnel and financial resources required for implementing an outdoor and indoor air quality monitoring program</td>
</tr>
</tbody>
</table>
Objective EE.5.3: Conduct research directed at improving water security, including the amount, quality, and management of water available to Qatar

| Specific Aim | Improve water management and develop desalination technologies. |
| Key Stakeholders | Researchers and developers: MoE, QEERI, QU, QSTP, QCRI, Texas A&M University at Qatar, Northwestern University in Qatar, HEC Paris in Qatar, QP and subsidiaries, CNA-Q, QCRI, VCUQatar, QMIC |
| Enablers: Funding entities | Users or beneficiaries: MoE, MoEI, GORD, SCH, QP and subsidiaries |
| Regulator: MoE, SCH, MoEI, MoFA, Kahramaa |

**Actions**

Immediate (2012–2013):
- Conduct a technical assessment of near- and longer-term technical options for providing water for Qatar’s residents and industries
- Based on the above assessment, develop a multiyear research plan on water supply and desalination technologies
- Develop a multiyear research plan directed at improving water quality, conserving water, and limiting discharges, including leakage
- Conduct an analysis of the vulnerability of Qatar’s water supplies and measures that offer to improve water security

Medium term (2–5 years):
- Implement multiyear research plans

**KPIs**

Immediate (2012–2013):
- Technical assessment of water supply options completed
- Analysis of water security issues completed

**Challenges**

- Ensuring that a coordinated, multidisciplinary, multi-institutional approach is taken
- Maintaining focus on high-priority issues
<table>
<thead>
<tr>
<th><strong>Specific Aim</strong></th>
<th>Improve the health and sustainability of Qatar’s built environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Researchers and developers: QU, Texas A&amp;M University at Qatar, VCUQatar, HEC Paris in Qatar, CMUQ, CNA-Q, QSTP, QEERI, QCRI, GreenGulf, QFIS, GORD, QMIC</td>
</tr>
<tr>
<td><strong>Enablers:</strong> Funding entities</td>
<td>Users or beneficiaries: MMUP, MoE, industrial cities, Msheireb Properties, Barwa, Ashghal, Qatari Diar, Qatar 2022, QF, Kahramaa, Qatar Rail</td>
</tr>
<tr>
<td><strong>Regulator:</strong></td>
<td>MoE, Ministry of Commerce, MMUP, Kahramaa, Diar</td>
</tr>
<tr>
<td><strong>Actions</strong></td>
<td>Immediate (2012–2013): Document current research directed at Qatar’s built environment</td>
</tr>
<tr>
<td></td>
<td>Develop a multiyear plan for R&amp;D activities directed at improving Qatar’s built environment (including transportation, energy in building, materials, sensors, lifeline system, codes, and risks)</td>
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<tr>
<td></td>
<td>Understand the needs for major events (construction, integration) as a catalyst of technology development</td>
</tr>
<tr>
<td></td>
<td>Develop mechanisms to engage with civic society and advocacy groups for outreach activities</td>
</tr>
<tr>
<td>Medium term (2–5 years):</td>
<td>Implement a multiyear plan for R&amp;D activities directed at improving Qatar’s built environment</td>
</tr>
<tr>
<td></td>
<td>Develop instrumentation and ICT for making Qatar an efficient and easy city in which to live and operate (tools to use at home or outside the home: Qatar Dashboard) [QCRI]</td>
</tr>
<tr>
<td><strong>KPIs</strong></td>
<td>Immediate (2012–2013): All ongoing and recently completed research activities are documented in an electronic database</td>
</tr>
<tr>
<td></td>
<td>Multiyear research plan completed</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>Creating a balance between urgent needs and longer-term R&amp;D focusing on Qatar unique needs</td>
</tr>
<tr>
<td></td>
<td>Ensuring multidisciplinary approaches, including physical and health scientists, engineering, and the social sciences</td>
</tr>
</tbody>
</table>
**Objective EE.5.5:** Develop improved approaches for solid waste management in Qatar, including reducing waste generation, increasing waste recycling, and mitigating the adverse impacts of waste disposal

<p>| Specific Aim | Improve solid waste management in Qatar in support of QNDS initiatives |
| Key Stakeholders | Researchers and developers: QU, Texas A&amp;M University at Qatar, QEERI, QSTP, QCRI, natural gas industries (sulfur), VCUQatar, Qatar’s heavy industries, Msheireb Properties, HMC, Shell, QP and subsidiaries, GORD Enablers: Funding entities Users or beneficiaries: MoE, MoBT, GORD, MMUP, HMC, QP and subsidiaries Regulator: MoE, MoEI/QP, MMUP/Ashghal, SCH |
| Actions | Immediate (2012–2013): Conduct policy research and technical assessments in support of a comprehensive national solid waste management plan, including hazardous and medical waste Develop a coordinated, multiyear R&amp;D plan for improving solid waste management Continue support for ongoing QU research pending the completion of the above multiyear R&amp;D plan Medium term (2–5 years): Implement a coordinated, multiyear R&amp;D plan for improving solid waste management Develop advanced computation tools for material innovation (QCRI) |
| KPIs | Immediate (2012–2013): Timely support provided to the development of the national solid waste management plan Completion and initiation of implementation of a multiyear R&amp;D plan |
| Challenges | Need to ensure multidisciplinary approach, including social science and communication research Maintaining focus on long-term issues unique to Qatar where Qatar-based R&amp;D can have a significant impact |</p>
<table>
<thead>
<tr>
<th><strong>Pillar: Energy and Environment</strong></th>
<th><strong>Planning Area:</strong> Global Climate Change</th>
<th><strong>Objective EE.6.1:</strong> Lower Qatar’s emissions of greenhouse gases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aim</strong></td>
<td>Actively seek to mitigate negative impacts of climate change through reduction of GHGs</td>
<td></td>
</tr>
<tr>
<td><strong>Key Stakeholders (excludes those required for Planning Areas 2 and 3)</strong></td>
<td>Researchers and developers: QP and subsidiaries, MoEI, MoE, QEERI, QCRI, QNSFP, QU, Texas A&amp;M University at Qatar, HEC Paris in Qatar, Northwestern University in Qatar, private companies (ExxonMobil, Maersk, Shell, heavy industries), QSTP, Kahramaa, GORD Enablers: Funding entities Users or beneficiaries: MoE, MoEI, MoFA, QP and subsidiaries, heavy industries Regulator: MoE, MoFA, MoEI, Kahramaa</td>
<td></td>
</tr>
<tr>
<td><strong>Actions</strong></td>
<td>Immediate (2012–2013): Develop a coordinated multiyear research plan Develop an inventory research in Qatar directed at reducing GHG emissions Continue research on establishing the viability of carbon sequestration in Qatar or its off-shore territory, including data collection and testing Conduct research in planning areas 2 and 3, both of which support reducing GHG emissions Coordinate a carbon network through Doha Carbon and Energy Forum Medium term (2–5 years): Identify opportunities to reduce GHG emissions generated by the heavy industries (nonpetroleum) that operate in Qatar</td>
<td></td>
</tr>
<tr>
<td><strong>KPIs</strong></td>
<td>Immediate (2012–2013): Completion of a coordinated multiyear research plan Establishment of inventory of Qatar research directed at reducing GHG emissions Completion of preliminary assessment of the viability of carbon sequestration in Qatar, including application of carbon dioxide in enhanced oil recovery Development of a carbon network through Doha Carbon and Energy Forum</td>
<td></td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>Requirement to attract appropriate specialists for extended research time in Qatar Access to data</td>
<td></td>
</tr>
</tbody>
</table>
### Pillar: Energy and Environment

#### Planning Area: Global Climate Change

**Objective EE.6.2:** Understand the potential impacts of climate change on Qatar’s natural and built environment

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Build baseline knowledge of projected climate-change impacts specific to Qatar as a driver for the development of mitigation strategies across all sectors</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: MoE, QEERI, QU, QSTP, QCRI, Texas A&M University at Qatar, Northwestern University in Qatar, HEC Paris in Qatar, QP, CNA-Q, QCRI, VCUQatar, GORD, QMIC  
Enablers: Funding entities  
Users or beneficiaries: MoE, MoFA, MoEI, GORD, SCH  
Regulator: MoE |
| Actions | Immediate (2012–2013):  
Develop a coordinated multiyear plan for determining potential impacts of climate change on Qatar and the Gulf region  
Evaluate available models for predicting regional climatic impacts on Qatar and the Gulf region  
Establish an electronic database that serves as an inventory of all activity in Qatar or sponsored by the government of Qatar that is directed at reducing or understanding the impacts of global climate change.  
Provide technical expertise and information required by MoFA and other ministries  

Medium term (2–5 years):  
With international partners, apply selected models for the purpose of determining the range of potential climatic impacts  
Create a model that translates climatic impacts to key variables affecting the quality of life, health, water, economic development, and agriculture in Qatar and the Gulf region |
| KPIs | Immediate (2012–2013):  
Selection of an institutional partner and climate model for examining impacts  
Completion of a coordinated multiyear plan for determining potential impacts of climate change on Qatar and the Gulf region  
Initial operation of the electronic database  
Mechanism in place for the timely provision of information to MoFA and other ministries |
| Challenges | Need to ensure that all technical work associated with climate-change issues is fully coordinated  
Need to develop a relationship with at least one research institution that has internationally recognized capabilities in modeling regional impacts of increased atmospheric concentrations of GHG concentrations  
Need to establish a mechanism by which MoFA and other ministries can receive scientific advice on a confidential basis appropriate to foreign policy negotiations |
<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Build a cadre of expertise in advanced materials to enhance research capabilities in energy, environment, and health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: QU, Texas A&amp;M University at Qatar, QSTP, MoE (central labs), QEERI, GORD, QP and subsidiaries, QCRI, Sidra, Porsche, Volkswagen Enablers: Funding entities Users or beneficiaries: QP and subsidiaries, Qatar-based industries, technology developers, Ashghal, Qatar Rail, Qatar Mining Company, QSTP Regulator: None indicated</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Develop a multiyear national research program in materials science, including provisions for basic and fundamental studies and applied research Identify, strengthen, and build on existing Qatar-based capabilities in materials science Medium term (2–5 years): Implement multiyear national research program in materials science, including provisions for basic and fundamental studies and applied research Develop a research program on catalysts Develop a research program in nanotechnology Explore applications for sulfur and other industrial by-products in advanced materials</td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Completion of a coordinated multiyear research plan Periodic reviews of progress</td>
</tr>
<tr>
<td>Challenges</td>
<td>Need to maintain focus on areas that offer highest payoff to Qatar Requirement to develop and cross-sector research plan and program Need to attract and retain a critical mass of researchers within priority materials research areas</td>
</tr>
</tbody>
</table>
APPENDIX C: Computer Sciences and Information and Communication Technology Aims, Actors, Actions, Accountability and Challenges
Pillar: Computer Sciences and Information and Communication Technology

Objectives

**Objective ICT.1.1:** Adopt a needs-driven, phased approach to developing an NCIR with an integrated, national-scale, computing and data capability and connect it to the worldwide computing infrastructure.

Specific Aim

Provide essential computing infrastructure and information security for the research community and other stakeholders in Qatar.

Key Stakeholders

Researcher/developer: CMUQ, Texas A&M University at Qatar, MEEZA, IBM, Microsoft, QTel, Vodafone
Enablers: Funding entities
Users/beneficiaries: QU, QCRI, QBRI, QEERI, WCMC-Q, Texas A&M University at Qatar, CMUQ, QSTP, QNRF, HMC, QMIC, QNBN, GBI, ictQatar
Regulator: ictQatar

Actions

Immediate (2012–2013):
- Assemble a roundtable with stakeholders to
  - identify existing computing infrastructure and specific research needs
  - identify possibilities for outsourcing
- Produce an implementation white paper
- Develop a regulatory framework

Medium term (2–5 years):
- Develop and deploy computing infrastructure
- Develop appropriate agreements, partnerships, and participation in the international scientific computing organizations
- Develop a research capacity in computing infrastructure

KPIs

Immediate (2012–2013):
- Research needs of stakeholders identified
- Phases of implementation identified
- Regulatory framework defined

Challenges

Overall infrastructure investments need to be aligned.
Financial resources for infrastructure need to be allocated. Availability of human resources for development and maintenance.
**Pillar: Computer Sciences and Information and Communication Technology**

**Planning Area:** Computing and Data Analytics

**Objective ICT.2.1:** Build on the established research program on advanced data management technologies, real-time data management, and data mining and analysis

| Specific Aim | Create local knowledge and capabilities in advanced data-management technologies, real-time data management, and data mining and analysis |
| Key Stakeholders | Researchers and developers: QCRI, QU, CMUQ, QSTP, QMIC  
Funding entities: QSA, Sidra, MEEZA  
Users/beneficiaries: Government, academia, and industry  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
- develop processes for coordination  
- determine specific infrastructure needs  
- clarify and discuss policy, operational, security, and legal aspects (IPR and data protection and privacy issues)  
Develop an implementation white paper  
Define the regulatory framework |
| KPIs | Immediate (2012–2013):  
Research needs of stakeholders identified  
Coordination and governance processes in place  
Partnerships and relationships established  
Phases of implementation identified  
Regulatory framework defined |
| Challenges | Need for researchers with data-mining expertise  
Need for a data-management and storage infrastructure  
Access to data |
### Pillar: Computer Sciences and Information and Communication Technology

#### Planning Area: Computing and Data Analytics

**Objective ICT.2.2:** Build a research program on distributed, data-intensive and service-oriented computing

| Specific Aim | Create local knowledge and capabilities in distributed, data-intensive and service oriented computing |
| Key Stakeholders | Researchers and developers: QU, QCRI, CMUQ, MEEZA, QU, QMIC, Texas A&M University at Qatar, QSTP  
Enablers: Funding entities  
Users or beneficiaries: Government (i.e., Kahramaa, MoI, ictQatar (Hukoomi), academia and industry (i.e., Shell and Exxon), QRSC  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
• identify current areas of research, research capabilities, priorities, and research needs  
• determine specific infrastructure needs  
• develop processes for coordination  
Develop an implementation white paper  
Define the regulatory framework |
| KPIs | Immediate (2012–2013):  
Implementation white paper completed  
Partnerships and agreements formed |
| Challenges | Infrastructure and space  
Human resources |
**Pillar: Computer Sciences and Information and Communication Technology**

**Planning Area:** ALTs and Social Computing  
**Objective ICT.3.1:** Become a global Research Center of Excellence in ALTs

| Specific Aim | Support Qatar’s distinctive culture and harness Qatar’s comparative advantage in ALT |
| Key Stakeholders | Researchers and developers: QCRI, CMUQ, QU, QSTP  
Enablers: Funding entities, Al Jazeera, Qtel, Vodafone, QBS, QMA  
Users or beneficiaries: ictQatar, Al Jazeera, QMIC, QSTP (Loghati content management platform) other academia government and industry  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
- encourage data sharing and partnerships  
- identify possible ALT applications  
- explore connections with social computing initiatives  
- clarify and discuss policy, operational, and legal aspects (IPR and data protection and privacy issues)  
Develop an implementation white paper  
Medium term (2–5 years):  
Identify local Arabic linguist capacity and options to develop or acquire capability  
Develop and roll-out Loghati web-based technology (QSTP)  
Long term (5–10 years):  
Explore opportunities to develop applications for other languages |
| KPIs | Immediate (2012–2013):  
Data sources identified  
Possible ALT applications identified  
Partnerships and agreements formed  
Implementation white paper completed  
Make Loghati fully available to market by mid-2013 (QSTP) |
| Challenges | Developing Arabic linguist capacity  
Need for data-management and storage infrastructure  
Need for researcher capacity (development of algorithms)  
Data-protection and privacy issues |
### Pillar: Computer Sciences and Information and Communication Technology

#### Planning Area: ALTs and Social Computing

**Objective ICT.3.2:** Organize a multi-institutional social computing initiative with academia, industry, and international partners

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Support Qatar’s distinctive culture and harness Qatar’s comparative advantage in social computing</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: QCRI, CMUQ, QU, QSTP, QMIC  
Enablers: Funding entities, Al Jazeera, Qtel  
Users or beneficiaries: ictQatar, Al Jazeera, other academia, government, and industry  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
- encourage data sharing and partnerships  
- explore connections with ALT  
- identify possible applications  
- identify areas of multidisciplinary research  
- clarify and discuss policy, operational and legal aspects (IPR and data protection and privacy issues)  
Develop an implementation white paper |
| KPIs | Immediate (2012–2013):  
Data sources identified  
Possible applications identified  
Partnerships and agreements formed  
Implementation white paper completed |
| Challenges | Need for data-management and storage infrastructure  
Need for researcher capacity (development of algorithms)  
Data-protection and privacy issues |
**Objective ICT.4.1:** Develop an R&D program on wireless networking to develop and employ an integrated, next-generation, wireless-sensor network and to include research on mobile applications and services

| Specific Aim | Utilize wireless-sensor networks and mobility technologies to develop platforms, connectivity protocols and technologies, applications, and services that support existing industries, promote new industries, and encourage economic diversification |
| Key Stakeholders | Researchers and developers: QMIC, QSTP (RASAD), QU, Texas A&M University at Qatar, CMUQ  
Enablers: Funding entities  
Users or beneficiaries: ICSS (2022 applications), government and industry  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to identify current areas of research, research capabilities, priorities, and research needs  
Develop an implementation white paper |
| KPIs | Immediate (2012–2013):  
Implementation white paper completed  
Partnerships and agreements formed |
<p>| Challenges | Recruiting and retaining skilled human resources |
| Specific Aim | Develop embedded and integrated systems and sensor technologies that support existing industries, promote new industries, and encourage economic diversification |
| Key Stakeholders | Producer or developer: QMIC, QCRI, QSTP, QU, Texas A&amp;M University at Qatar, CMUQ Enablers: Funding entities Users or beneficiaries: ICSS (2022 applications), HMC, Aspetar, Al Ahli hospital, SCH, other government and industry Regulator: ictQatar, SCH |
| Actions | Immediate (2012–2013): Assemble a roundtable with stakeholders to identify current areas of research, research capabilities, priorities, and research needs Develop an implementation white paper |
| KPIs | Immediate (2012–2013): Implementation white paper completed Partnerships and agreements formed Enable preventive and personalized medicine in the country by mid-2013 (QSTP) |
| Challenges | Recruiting and retaining skilled human resources |</p>
<table>
<thead>
<tr>
<th>Planning Area: Systems, Applications, and Robotics</th>
<th><strong>Objective ICT.4.3:</strong> Build an R&amp;D program on applied robotics with use-inspired applications to include work on computer vision and the integration of state-of-the-art robotics systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Aim</td>
<td>Develop robotic systems and applications that support existing industries, promote new industries, and encourage economic diversification</td>
</tr>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: CMUQ, Texas A&amp;M University at Qatar, QSTP, QU, QRSC  Enablers: Funding entities  Users or beneficiaries: QP, RasGas, HMC, Shell, Ashghal, other industry and government  Regulator: ictQatar</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013):  Assemble a roundtable with stakeholders to identify current areas of research, research capabilities, priorities, and research needs  Develop an implementation white paper</td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013):  Implementation white paper completed  Partnerships and agreements formed</td>
</tr>
<tr>
<td>Challenges</td>
<td>Recruiting and retaining skilled human resources</td>
</tr>
</tbody>
</table>
## Objective ICT.5.1: Develop an R&D program on information security

**Specific Aim**
Improve information security for the research enterprise and develop information security applications to support Qatar’s needs

**Key Stakeholders**
Researchers and developers: QU, CMUQ, ICSS, QMIC (mobility), CID (MoI), QCERT
Enablers: Funding entities
Users or beneficiaries: Academia, government and industry
Regulator: ictQatar

**Actions**
**Immediate (2012–2013):**
- Assemble a roundtable with stakeholders to
  - identify, stakeholders, current areas of research, research capabilities, and research needs
  - develop a dedicated R&D framework
  - identify critical infrastructure needs
  - identify or define a regulatory framework
- Develop a coordination process or mechanism
- Develop an implementation white paper

**Medium term (2–5 years):**
- Develop local capacity in information security research
- Development of information security applications

**KPIs**
**Immediate (2012–2013):**
- Implementation white paper completed
- Partnerships and agreements formed

**Challenges**
- Recruiting and retaining skilled human resources
- Access to data in terms of privacy and regulation
## Pillar: Computer Sciences and Information and Communication Technology

### Objective ICT.5.2: Develop a demand-driven bioinformatics research program serving both genomics-driven investigations and emerging research efforts in energy and environment

| Specific Aim | Enable and enhance research capabilities in other sectors |
| Key Stakeholders | Researchers and developers: QCRI, QMIC, CMUQ, QBRI, QU  
Enablers: Funding entities  
Users or beneficiaries: QEERI, QBRI, Shafallah, HMC, Sidra, WCMC-Q  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
• identify, stakeholders, current areas of research, research capabilities, and research needs  
• develop a dedicated R&D framework  
Develop a coordination process or mechanism  
Develop an implementation white paper |
| Medium term (2–5 years):  
Develop a focused research portfolio for bioinformatics research program  
Build research capacity in bioinformatics |
| KPIs | Immediate (2012–2013):  
Implementation white paper completed  
Partnerships and agreements formed |
| Challenges | It will be difficult to build a program and acquire expertise until needs are clearly identified; moving forward depends on other institutes finalizing their charters |
### Pillar: Computer Sciences and Information and Communication Technology

#### Planning Area: Crosscutting and Enabling

**Objective ICT.5.3:** Develop a national research program in high-performance modeling, simulation, visualization, and data analysis that crosscuts a variety of scientific areas

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Provide tools and capacity to support and enable other research sectors through high-performance modeling, simulation, visualization, and data analysis</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: QCRI, QU, Texas A&M University at Qatar, CMUQ, QSTP, QRSC  
Enablers: Funding entities  
Users or beneficiaries: Government, academia, and industry  
Regulator: ictQatar |
| Actions | Immediate (2012–2013):  
Assemble a roundtable with stakeholders to  
- identify, stakeholders, current areas of research, research capabilities, and research needs  
- develop a dedicated R&D framework  
Develop a coordination process or mechanism  
Develop an implementation white paper  

Medium term (2–5 years):  
Develop research portfolio  
Build research capacity |
| KPIs | Immediate (2012–2013):  
Implementation white paper completed  
Partnerships/agreements formed |
| Challenges | |
APPENDIX D: Health Aims, Actors, Actions, Accountability and Challenges
<table>
<thead>
<tr>
<th>Pillar: Health</th>
<th><strong>Objective HE.1.1:</strong> Develop and implement comprehensive research programs to improve early diagnosis, services, behaviors and outcomes related to type 2 diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Aim</td>
<td>Research that leads to reduced incidence of and improved patient management for diabetes and improved health outcomes (reduced nonfatal burden and mortality from diabetes)</td>
</tr>
<tr>
<td>Key Stakeholders</td>
<td>Researcher or developer: QBRI, Cardiovascular Research Center, Sidra, HMC and HMC AHCs, WCMC-Q and other Education City universities: clinical and related research; QU, ADL: conduct and support studies on disease etiology and risk factors, including relationship to lifestyle; Primary Care Corporation: identify patient population, implement and test interventions, interface with community; SEC: same as previous, supporting healthy living; community pharmacies: community outreach (existing outreach program); Aspire Zone: mandated by Emiri decree to contribute to population health through physical activity; QSTP (current or future tenant organizations); QSTP-RASAD: as per previous objective, QMIC</td>
</tr>
<tr>
<td>Enablers:</td>
<td>Funding entities, QSTP, ADL, Diabetes Association</td>
</tr>
<tr>
<td>Regulator:</td>
<td>SCH</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Establish a data registry of type 2 diabetes Conduct public campaigns (physical and nutrition program for school children)</td>
</tr>
<tr>
<td>Medium term (2–5 years): Review national research progress, outcomes, and priorities every 3 years Support the role of PHC to serve the patients as a primary health provider Establish natural food remedies</td>
<td></td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Number of patients admitted to hospitals with diabetes complications Prevalence of elevated hemoglobin A1C among diabetic patients (reflecting level of control of diabetes) Level of public understanding of diabetes prevention, etiology, treatments, and complications</td>
</tr>
<tr>
<td>Challenges</td>
<td>---</td>
</tr>
<tr>
<td><strong>Pillar: Health</strong></td>
<td></td>
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<tr>
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<tr>
<td><strong>Planning Area:</strong> National Health Priorities</td>
<td></td>
</tr>
<tr>
<td><strong>Objective HE.1.2:</strong> Implement the National Cancer Research Strategy to improve basic knowledge, services, behaviors, and outcomes related to cancers</td>
<td></td>
</tr>
</tbody>
</table>

| **Specific Aim** | Research that leads to reduced incidence of and better patient management for cancers and better health outcomes (reduced burden and mortality from cancers) |
| **Key Stakeholders** | Researchers and developers: Qatar National Cancer Care and Research Hospital, HMC public hospitals, private hospitals, Education City universities, ADL (research into cancer biomarker discovery); QSTP (current or future tenant organizations—for example, QSTP has existing commercial product with GE for mammography and looking to develop next generation of noninvasive or less traumatic mammography in conjunction with GE); QSTP-deltaDot has developed a diagnostic screening tool to determine breast cancer biomarkers; QSTP (QRSC) for surgical oncology (cancer related surgical interventions) |
| **Enabler:** Funding entities, Al Amal Hospital, QSTP |
| **Users:** Other GCC countries |
| **Regulator:** SCH |

<table>
<thead>
<tr>
<th><strong>Actions</strong></th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin to implement national cancer strategy—all actions in the strategy</td>
<td></td>
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<tr>
<td>Develop strategies to reduce tobacco use</td>
<td></td>
</tr>
<tr>
<td>Define specific research projects around most-prevalent cancers (preventive and therapeutic orientation to this research)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Medium term (2–5 years):</strong></th>
<th>Pursue multicenter approach to cancer research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine cancer biomarkers in patients and develop diagnostic screening tools for these</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>KPIs</strong></th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of the cancer strategy</td>
<td></td>
</tr>
<tr>
<td>Percentage of specified populations screened for designated cancers (e.g., cervical, breast, colorectal)</td>
<td></td>
</tr>
<tr>
<td>Number of research projects related to cancer, funded, publications, Qataris trained</td>
<td></td>
</tr>
</tbody>
</table>

<p>| <strong>Challenges</strong> | Small number of patients in Qatar |</p>
<table>
<thead>
<tr>
<th>Planning Area: National Health Priorities</th>
<th><strong>Objective HE.1.3:</strong> Develop and implement research programs to reduce infectious disease transmission in communities and hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aim</strong></td>
<td>Research that leads to reduced incidence, better diagnosis and treatment, and better health outcomes related to infectious diseases (reduced nonfatal burden and mortality)</td>
</tr>
</tbody>
</table>
| **Key Stakeholders**                     | Researcher or developer: Research centers: HMC (infectious-disease department), QU, ADL, QBRI, WCMC-Q, QSTP (current or future tenant organizations); Aspetar (screens athletes for infectious diseases—e.g., hepatitis B—every 2–3 months)  
Enablers: Funding entities, QSTP, SCH, ADL  
Regulator: SCH |
| **Actions**                              | Immediate (2012–2013):  
Identify manageable number of priority infectious diseases for research (SCH, HMC)  
Conduct collaborative research to monitor hospital-acquired infections and antimicrobial resistance  
Monitor food supplies that are prone to bacterial contamination (consider HACCP approach)  

Medium term (2–5 years):  
Undertake collaborative basic, applied, and translational research into salient diseases and publish and commercialize the output  
Conduct real-time bio surveillance for ongoing monitoring |
| **KPIs**                                 | Immediate (2012–2013):  
Incidence of relevant infectious diseases  
Papers published in peer-reviewed journals (consider weighting by journal impact factor) |
| **Challenges**                           | Poor epidemiological data and limited interest in infectious-disease research |
Pillar: Health
Planning Area: National Health Priorities

**Objective HE.1.4:** Develop and implement child health research programs to address the most-pressing issues related to child health, including stillbirths

| Specific Aim | Coordinated research network
| | Excellent ethics review, including in-country expertise to deal with ethical issues relating to vulnerable subjects
| | Greater understanding by patients and the lay public; greater participation in research
| | Evidence-based clinical guidelines and greater compliance with guidelines
| | Greater understanding of disease mechanisms, which leads to more targets for identification
| | Improved policy decision-making based on quality health statistics
| | Improved health outcomes; reduced disease burden

| Key Stakeholders | Researchers and developers: Sidra, HMC, Shafallah, Aspetar, Aspire Academy, WCMC-Q, QBRI, Al-Ahli, Dhreima, Center for Protection of Women and Children; QSTP (current or future tenant organizations—in particular, GE with integration of RASAD into V-Scan mobile ultrasound device)
| | Enabler: Funding entities, QNRF, QSTP, Child Health Work Group
| | Regulator: SCH

| Actions | Immediate (2012–2013):
| | Consider or address priority areas from December 2011 workshop: genetics or genomics of congenital and complex diseases, obesity and diabetes prevention and treatment, injury prevention and treatment of traumatic brain injury, adverse pre and perinatal outcomes, allergies, asthma, and infectious diseases
| | Establish a State Committee for Child Health and incorporate the development of a research subcommittee
| | Establish a child and adolescent health research network
| | Establish national IRB for maternal and child health research
| | Utilise current and new TID screens and research in the SEC schools by AZF (Aspetar and Aspire Academy)
| | Plan and implement specific actions to improve health data collection and reporting

| Medium term (2–5 years): |
| | As infrastructures supporting research are built, commit to making them broadly accessible and ensure that there is no duplication of infrastructures
| | Develop mechanisms to facilitate inter institutional mentorship.
| | Collaborate across institutions in recruitment so that members of other organizations sit on recruitment committee
| | Implement cross-appointments (i.e., joint appointments to multiple institutions)
| | Seek ways to build culture of research by giving medical students, or students even earlier, mentorship and access to research
| | Undertake collaborative basic, applied, and translational research into
salient diseases and publish and commercialize the output
Establish a program for the profiling of age groups in the community as a precursor to the identification of athletic talent (children 12 years and older) to characterize genetic markers associated with health, performance and exercise. (AZF: Aspetar and Aspire Academy)

### KPIs
Immediate (2012–2013):
- Establishment of community genetic and genomic profiles
- Application of this database (profile) for the TID of children and adolescents
- Application of genetic or genomic profiling data for the development of community activity programs

### Challenges
- Poor coordination and potential duplication of efforts
- Limited number of workers worldwide with sufficient knowledge
- Patient volume in some areas may not reach critical level
| Pillar: Health | **Objective 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 |

| Specific Aim | Coordinated research network  
Excellent ethics review including in-country expertise to deal with ethical issues relating to vulnerable subjects  
Greater understanding by patients and the lay public; greater participation in research  
Evidence-based clinical guidelines and greater compliance with guidelines  
Greater understanding of disease mechanisms, which leads to more targets for identification  
Improved policy decision making based on quality health statistics  
Improved health outcomes; reduced disease burden |

| Key Stakeholders | Researcher or developer: Sidra, HMC, Primary Care, Biobank, QBRI, Al Ahli Hospital, QSTP tenant VHB, other QSTP (current or future tenant—GE V-Scan and RASAD collaboration)  
Enabler: Funding entities, QNRF, QSTP  
Regulator: SCH |

| Actions | Immediate (2012–2013):  
Establish a pre-conception counseling and antenatal screening program  
Establish national IRB for maternal and child health research  
Establish birth cohort registry  
Medium term (2–5 years):  
As infrastructures supporting research are built, commit to making them broadly accessible and ensure that there is no duplication of infrastructures  
Establish research programs to better understand important obstetrical syndromes, e.g., gestational diabetes, intrauterine growth retardation, postpartum depression, other affective disorders, preterm labor, stillbirth  
Establish a national birth cohort  
Develop mechanisms to facilitate inter institutional mentorship  
Collaborate across institutions in recruitment so that members of other organizations sit on recruitment committee  
Implement cross-appointments (i.e., joint appointments to multiple institutions)  
Seek ways to build culture of research by giving med students, or students even earlier, mentorship or access to research  
Undertake collaborative basic, applied, and translational research into salient diseases and publish and commercialize the output |

| KPIs | Immediate (2012–2013):  
Establishment of pre-conception counseling and antenatal screening program  
Establishment of national IRB for maternal and child health  
Establishment of national birth cohort registry |

| Challenges | Poor coordination and potential duplication of efforts  
Limited number workers worldwide with sufficient knowledge  
Patient volume in some areas may not reach critical level |
Pillar: Health

National Health Priorities

Objective HE.1.6: Create a dedicated research program focused on the understanding of the genetic causes of diseases and conditions in Qatar

Specific Aim

Better public understanding of diseases and conditions with genetic correlates
Better prevention, diagnosis, and genetic counseling for these diseases and conditions
Better health outcomes for genetically related diseases
Collaborative international research projects in Qatar studying genetically related diseases and conditions identified in Qatar and the region

Key Stakeholders

Researchers and developers: Shafallah, Sidra, HMC (patient care, referrals as needed to Shafallah, collaboration on research addressing genetic correlates of diseases other than congenital conditions); hospitals, analytical labs (monitor IEMs via newborn screening); AZF Aspetar and Aspire Academy (collaborating with Shafallah to understand genetic correlates of cardiomyopathies and sporting potential); ADL (research into genetic linkages to diseases and conditions); QSTP current or future tenant organizations (research collaboration, such as Biogem/QU on technology transfer program and animal labs—to date, 2 Qatari students have completed studies in Biogem, home of 3 Nobel prize winners)
Enabler: Funding entities, QNRF, Biobank, ADL (information and material supporting genetic research), QSTP
Regulator: SCH

Actions

Immediate (2012–2013):
Develop laboratory analytical capabilities for screening and confirmation of IEMs, which can be reversed through dietary interventions
Link premarital checkup results with Shafallah’s neonatal genetic screening program
Build international collaborations to study how local genetic variations affect brain function
Provide and evaluate counseling services through medical centers for families with afflicted newborns to address the needed care and handling of these children

Medium term (2–5 years):
Develop a database on human genetic variation in the Gulf
Identify common genetic trends in Qatar and their linkage to diseases, and suggest research needed and potential tools to prevent their occurrence or treat or mitigate their severity
Identify age-related (particularly child and adolescent) conditions and correlates (e.g., Down syndrome and maternal age)
Use Biobank information and material to support these genetics studies.
Develop a research program in behavioral genetics

KPIs

Immediate (2012–2013):
Proportion of eligible populations screened (premarital, neonatal, other)
and number of targets screened for genetic abnormalities
Number of individuals receiving counseling before and after marriage
Age-dependent development of conditions and identification of likely genetic and genomic factors

<p>| Challenges | High rate of consanguineous marriages and birth defects in Qatar; need to address a broader range of problems with potential genetic links (e.g., diabetes, cancers); clarify prevention and treatment as the aims of genetics research |</p>
<table>
<thead>
<tr>
<th>Pillar: Health</th>
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</thead>
<tbody>
<tr>
<td>Planning Area: National Health Priorities</td>
</tr>
<tr>
<td><strong>Objective HE.1.7:</strong> Implement research programs on cardiovascular diseases, including integration with diabetes research and translational and health services research</td>
</tr>
<tr>
<td>Specific Aim</td>
</tr>
<tr>
<td>Key Stakeholders</td>
</tr>
<tr>
<td>Enabler:</td>
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<tr>
<td>Regulator:</td>
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<tr>
<td>Actions</td>
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<tr>
<td>KPIs</td>
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<tr>
<td>Challenges</td>
</tr>
</tbody>
</table>
## Pillar: Health

### Planning Area: National Health Priorities

<table>
<thead>
<tr>
<th>Objective HE.1.8: Develop and implement research programs to understand the causes and reduce the occurrence and impact of RTAs (motor vehicle injuries)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aim</strong></td>
</tr>
<tr>
<td><strong>Key Stakeholders</strong></td>
</tr>
<tr>
<td><strong>Enabler:</strong> Funding entities, Mol and SCH (data), HMC and trauma center (services, data), QSTP, Committee for Road Traffic Accidents</td>
</tr>
<tr>
<td><strong>Regulator:</strong> Mol, SCH</td>
</tr>
</tbody>
</table>
| **Actions** | Immediate (2012–2013): Revive or create multi ministry committee focused on research in this area
Review the data registry, use epidemiologic analyses to characterize the “person place-time” profile of RTAs, and help identify opportunities to reduce risk factors; identify additional data needed
Make trauma data available to research institutions to be analyzed (online databases)
Conduct more research on trauma
Conduct research on driver behavior to identify applications for RASAD
Expand TRL/RASAD projects to a national level
Conduct random testing for drugs (especially alcohol and illicit drugs) among drivers to monitor incidence of driving under the influence |
| Medium term (2–5 years): Create more-efficient data-collection tools to capture preventable causes of these injuries
Develop new interventions to improve safe driving (e.g., QSTP tenant Williams F1 has developed driving simulator for training race car drivers, but same technology can be used to train young drivers)
Develop and implement public health, engineering, and transportation interventions based on evidence from the ongoing research |
| **KPIs** | Immediate (2012–2013): Number of RTAs, deaths from RTAs, number and severity of nonfatal outcomes from RTAs
Research projects under way to assess or reduce road traffic injuries
Interventions implemented |
| **Challenges** | Stigmatization of mental health in Qatar (as elsewhere worldwide)
Coordination & alignment |
<table>
<thead>
<tr>
<th>Objective 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</th>
</tr>
</thead>
</table>
| **Specific Aim** | Improvements in the standards and quality of mental health care in Qatar  
Better public understanding of mental health (to decrease stigma)  
Ethical compliance for research conducted on individuals with mental health issues |
| **Key Stakeholders** | Researchers and developers: HMC AHC Insitute of Neuroscience, HMC, QBRI, Aspetar, Aspire Academy, Doha International Family Studies and Development (clinical and health services research); QSTP (current or future tenant organizations)  
Enabler: Funding entities, QNRF, QSTP, National Committee on Mental Health  
Regulator: SCH (policy) |
| **Actions** | Immediate (2012–2013):  
Collect data to establish baseline understanding the magnitude and distribution of selected mental conditions, and inform future research priorities (e.g., depression, schizophrenia, bipolar disorder, anorexia, bulimia)  
Expand profiling of children and adolescents 12 years and older (pool of age group athletic talent) to characterize genetic markers associated with health, performance (including exercise and sport), and cognitive ability and maturity  
Establish a range of tools and resources for identification and diagnosis and treatment of a range of conditions in children and adolescents (e.g., use of biofeedback facilities, techniques, and tools to aid in the identification and treatment of conditions, such as ADHD [MindRoom])  
Conduct research into the impact of neurologic and mental disorders on families, and improve recruitment of human subjects into research studies |
| **Medium term (2–5 years):** | Assess outcome data from research on the impact on families and communities |
| **KPIs** | Immediate (2012–2013):  
Communication and implementation of mental health act |
| **Challenges** | Stigmatization of mental health in Qatar (as elsewhere worldwide) |
**Objective HE.1.10:** Develop and implement research programs to increase participation in and health benefits from sport

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Research that leads to increased sports performance and participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: Aspire, Aspetar, ADL, SEC, schools and community centers, Qatar Olympic Committee; QSTP (current or future tenant organizations: QSTP/QRSC for orthopedic surgery)</td>
</tr>
<tr>
<td>Enabler:</td>
<td>Funding entities, QNRF, QSTP, ADL</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Implement research objectives established with Aspetar and Aspire Academy, including football injuries, Ramadan and sport, groin pain, sports cardiology, pre participation screening, environmental physiology, and healthy lifestyle Conduct research on injuries in sport during adolescence (pre- and post puberty) Establish education programs for coaches and other professionals in relation to growth-related diseases and issues Organize campaigns to empower people to engage in sport Provide research-based public education on the benefits of sport on health Conduct research into the current usage patterns and associated health implications of doping, &quot;power drinks,&quot; and drugs in sport and in the wider Qatari community</td>
</tr>
<tr>
<td>Medium term (2–5 years): Develop strategies to involve the whole child and adolescent school population in sport with a theme of its positive impact on health and lifestyle, link with the Qatar Olympic Committee Schools sport program Implement ETSS Project 11.1: development of sports teachers and sports curriculum for K–12 students (SEC)</td>
<td></td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Measures of social connection, e.g., number of national events, number of events within different neighborhoods and clubs Measures of participation, e.g., number of participants at national events (such as Wheels n Heels, National Sports Day events, Olympic Day); number of children participating in after-school activities, such as Aspire Talent Centers or Aspire Active; number of people participating in major activity initiatives [such as AZF 10,000 steps program])</td>
</tr>
<tr>
<td>Challenges</td>
<td>Coordination among entities</td>
</tr>
</tbody>
</table>
### Pillar: Health

#### Planning Area: National Health Priorities

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Development of a health-literate population whose members actively engage in community-based programs and health research and intervention projects</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: SEC, HMC, Biobank, QSTP tenant VHB, nongovernmental organizations, AZF; QSTP with RASAD platform with ability to measure physical activity and integrate with social media and lifestyle coaches, QMIC  
Enabler: Funding entities, QNRF, QSTP, media  
Regulator: SCH, SEC |
| Actions | Immediate (2012–2013):  
Coordinate efforts through the lifestyle committee  
Create community-based spaces that foster good health, and use these spaces for public health intervention research  
Conduct research-based public campaigns through media, schools, and public outlets  
Conduct research to measure public participation and impact of nation-declared days (e.g., Healthy Lifestyle Day)  
Conduct research to measure public participation and impact of campaigns through medical centers and hospitals to engage outpatients toward healthy lifestyles  
Conduct research and media campaigns about the effects of tobacco consumption (e.g., smoking, chewing)  
SCH should actively endorse and evaluate the effectiveness of coordinated campaigns |
| Medium term (2–5 years): | Create, identify, and support nongovernmental organizations to motivate and empower the public toward healthy living  
Support the expansion and national integration of extracurricular physical activities to foster health, skill development, and TID  
Utilize social media to permeate healthy lifestyle messages into activities and strata of society that traditional government programs do not reach  
Implement SCH framework for undertaking clinical trials, including active state support to elevate the understanding of why these are important both locally and globally and encourage participation  
Implement ETSS Project 11.1: development of sports teachers and sports curriculum for K–12 students (SEC) |
| KPIs | Immediate (2012–2013):  
Level of public participation in research and government policies  
Incidence (monitoring) of selected behavioral risk factors  
Medical and health care costs  
Number of observational studies  
Health literacy of the population |
<table>
<thead>
<tr>
<th>Challenges</th>
<th></th>
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<tbody>
<tr>
<td>Cultural sensitivity to human testing</td>
<td></td>
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<tr>
<td>Lack of state public endorsement of clinical trials</td>
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<td>Pillar: Health</td>
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<tr>
<td><strong>Planning Area:</strong> National Health Priorities</td>
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</tr>
<tr>
<td><strong>Objective HE.1.12:</strong> Conduct cross-sector, multidisciplinary research to reduce the adverse effects of the environment on health [see also EE.5.1 and EE.5.2]</td>
<td></td>
</tr>
</tbody>
</table>

| Specific Aim | Research that leads to better understanding of environmental risk factors, practical actions to reduce the adverse health effects of environmental factors, reduced incidence of diseases and conditions resulting from environmental exposures, and better health outcomes (reduced nonfatal burden and mortality) |
| Key Stakeholders | Researchers and developers: QEERI, QBRI, ADL, AZF, Customs, testing laboratories, Aspetar (investigation of effects of acclimatization and adaptation on health); QSTPRASAD currently developing a food tracking system with QNFSP to ensure that food is untainted throughout distribution process (applications in food transportation with QNFSP already under way), other QSTP tenant organizations, NGOs, QMIC |
| Enabler | Funding entities, QNRF, media |
| Regulator | SCH, MoE, QNFSP |

| Actions | Immediate (2012–2013): Establish mechanisms for collaboration and coordination between health and environment sectors (e.g., government, research institutions) Identify early priorities for research (e.g., air quality and health, food safety, counterfeit pharmaceuticals) Conduct studies (or establish ongoing surveillance) to obtain baseline data regarding contaminants in food and the environment Establish benchmarks for environmental and health outcomes Create public awareness on possible contaminants and their impact on health |
| Medium term (2–5 years): Establish strategies to reduce or eliminate contaminants, e.g., through import control, public education, and new legislation |

| KPIs | Immediate (2012–2013): Food and product testing that meets established quality standards Incidence of foodborne disease outbreaks |

<p>| Challenges |</p>
<table>
<thead>
<tr>
<th>Pillar: Health</th>
<th>Planning Area: National Health Priorities</th>
<th><strong>Objective HE.1.13:</strong> Conduct research on public health security and contingency planning in relation to major international sporting events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Aim</td>
<td>Research that leads to better understanding and the creation of a framework and categorization of risk factors and practical actions to reduce, mitigate, and respond to public health threats during major international sporting events</td>
<td></td>
</tr>
</tbody>
</table>
| Key Stakeholders | Researchers and developers: Qatar 2022, ICSS, WHO, London School of Economics, Aspire  
Enabler: Funding entities  
Regulator: SCH, Qatar Civil Defense |
| Actions | **Immediate (2012–2013):**  
Identify and engage key stakeholders  
Establish and commission research coalition (ICSS, LSE, WHO, and SCH)  
Develop a classification of public health treats during international sporting events with a focus on contingency planning within the context of heightened media focus  
Create response strategies for public health authorities  
Conduct primary research and interviews from the 2012 London Olympics and the UK Public Health Authorities  
Establish benchmarks for the identification and response plans  
Publish a research report in 2012  
Convene and host a panel debate on the above topic and research outcome during the International Sport Security Conference in Doha in March 2013  
Secure additional funding for further extensive R&D of contingency response plans |
| KPIs | **Immediate (2012–2013):**  
Classification model and benchmark developed  
Framework for analysis and planning established  
Set of recommendations for further focused research  
A framework developed for coordinated contingency planning and response across relevant stakeholders |
| Challenges | Securing coordination and cooperation across key stakeholders and alignment between international and local policy and approaches |
## Objective HE.2.1: Establish a national translational research center and implement a robust translational research network to address nationally significant health challenges

| Specific Aim | Robust, well-coordinated translational research enterprise that leverages external resources, facilitates collaboration, and produces results that improve health and inject value back into the health economy |
| Key Stakeholders | Researchers and developers: HMC Translational Research Institute, QBRI, Sidra, current network members (Sidra, WCMC-Q) and new network members to be added (Shafallah, ADL, QU, Aspetar, private hospitals); Aspetar, Aspire Academy, ADL, QSTP tenant organizations (GE, VHB, and deltaDot), QSTP (QRSC) Enabler: Funding entities, QNRF, QSTP Regulator: SCH (policy, data) |
| Actions | Immediate (2012–2013): “Let the established center grow organically as the network.” Identify and clarify priority challenges requiring near-term translational research Develop and implement a mechanism to provide dynamic visibility of research across institutions Initiate a national clinical trial registry (SCH to lead) Medium term (2–5 years): Maintain active awareness of evolving translational research needs and opportunities Engage state agencies and multinational organizations to attract private-sector investment |
| KPIs | Immediate (2012–2013): Mechanisms in place to encourage collaboration Partnerships in place Network infrastructure (funding, administration) and database of participants developed Number of research projects funded in translational research Release of national ethics law |
| Challenges | Collaboration with all hospitals—private and public—and with biotechnology companies local and international |
| Specific Aim | Programs for public health education, training, data monitoring, and research in Qatar  
| | More trained public health professionals, including Qatari nationals and expatriates  
| | Evidence-based public health policy and population health programming |

| Key Stakeholders | Researchers and developers: QU (undergraduate public health program [non degree], participation in public health research); QF: postgraduate program (M.P.H. at HBKU); Sidra, HMC (hospital epidemiology training, participation in public health research); Aspetar (integrated into postgraduate training in sports medicine and associated fields); Aspire Academy (active Ph.D./postdoctorate to screen for and identify talent)  
| | Enabler: SCH  
| | Regulator: SCH: policy, monitoring and data, professional in-service and on-the-job training |

| Actions | Immediate (2012–2013):  
| | Develop a plan for undergraduate program for public health  
| | Develop a plan for postgraduate program (initially master’s level)  
| | Establish in-service training for public health professionals  
| | Establish hospital epidemiology training programs  
| | Develop national data, surveillance, and statistics to monitor disease incidence and trends  
| | Initiate research programs and projects addressing public health priorities  
| | Identify incentives for Qataris to enter health fields  

| Medium term (2–5 years):  
| | Implement plan for undergraduate program for public health  
| | Implement plan for postgraduate program (initially master’s level)  
| | Review annually the status of and needs to assess readiness for full school of public health  
| | Develop data and statistics on health-related priorities, such as aging, reproductive health, emerging infectious diseases, foodborne diseases, autism, birth defects, chronic diseases, obesity, physical activity, and breastfeeding, and consider behavioral risk-factor surveillance  
| | Conduct cohort intervention studies  
| | Initiate national project for training public-sector staff  
| | Develop system for measuring quality and efficiency of public health education and training  
| | (5–10 years): Establish doctorate-level public health program when appropriate |

| KPIs | Immediate (2012–2013):  
<p>| | Number of Qataris/non-Qataris enrolled and trained in short-term courses and long-term undergraduate and graduate degrees (note that all objectives directly or indirectly address enhancing skills of Qataris and monitor development of research capability) |</p>
<table>
<thead>
<tr>
<th>Challenges</th>
<th>Number of courses, course hours per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>QU: Collaboration with other entities for the research and focus more on prevention</td>
<td></td>
</tr>
</tbody>
</table>
### Pillar: Health

#### Planning Area: Enabling Platforms

**Objective HE.2.3:** Regularly review and revise, on an annual basis, the existing strategic plan for the Biobank to ensure that it remains a well-aligned research enabling infrastructure that meets national needs

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Biobank provides a robust enabling research platform for the research enterprise across Qatar</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: Research community, e.g., HMC, WCMC-Q, Shafallah, Sidra, QBRI, QU, ADL, Biobank, Aspetar, QSTP tenants, including VHB  
Enabler: Funding entities, QNRF, QSTP |
| Actions | Immediate (2012–2013):  
Engage actively with research institutions to fully understand user requirements.  
Maintain an active “stakeholder map”  
Support relevant grand-challenge research.  
Provide short training course on biobanking role in medical research to Undergraduate and postgraduate students in QU college of pharmacy and College of North Atlantic  
Conduct public education on the benefits of biobanking through various channels |
| medium term (2–5 years):  
Stay current (Biobank) with relevant emerging technologies.  
Conduct in-house research (by Biobank) on biobanking methods.  
Develop an electronic database with proper security |
| KPIs | Immediate (2012–2013):  
Measures of inputs (e.g., staff, technologies, facilities), processes (e.g., enabling research platform, community engagement), outputs (e.g., number of samples collected, number of projects supported, ease of access to Biobank samples, electronic database) |
| Challenges | Small “n” for potential specimens, inadequate sensitization and acceptance of the population to provide samples and return for repeat testing |
**Pillar: Health**

**Planning Area:** Enabling Platforms

**Objective HE.2.4:** Regularly review and revise, on an annual basis, the strategic plan for the Cardiovascular Research Center to ensure that its scope and activities meet national needs

**Specific Aim**
- Enhanced clinical care for cardiovascular diseases through translational and applied research
- Increased CVD research capacity
- Improved translation of cardiology screening protocols to improve diagnosis and formulate appropriate interventions

**Key Stakeholders**
- Researchers and developers: Research institute (QBRI, Cardiovascular Research Center); hospital centers, e.g., HMC (cardiac hospital) and HMC AHCs; private-sector hospitals; academic research centers, e.g., WCMC-Q, QU, Aspetar (cardiology services and research for athlete populations); QSTP with RASAD to provide ambulatory measures within different research projects; QSTP with GE to provide better screening (real-time ultrasound monitoring) of cardiovascular diseases; QSTP (QRSC) also discussing near-term collaboration with HMC in cardiothoracic surgery and intervention
- Enabler: SCH, QSTP, media

**Actions**
- Immediate (2012–2013):
  - Identify and engage the full range of clinical partners and researchers, including academic research centers
  - Review and revise plan
  - Implement research program
  - Convene public seminars to build database of research projects
  - Conduct public education through various channels and evaluate impact on health behaviors and health outcomes

  - Medium term (2–5 years):
    - Provide (through QCRC) population genetics and translational data on high-priority diseases, including diabetes, CVDs, cancer, infectious diseases, neurological diseases, and mental health

**KPIs**
- Immediate (2012–2013):
  - Measures of inputs (e.g., investments, project), processes (e.g., multidisciplinary or multi-institution projects), outputs (e.g., number trained, infrastructure improvement)

**Challenges**
Pillar: Health
Planning Area: Enabling Platforms

**Objective HE.2.5:** Establish health research training programs to ensure opportunities with dedicated research time away from service responsibilities

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Sustainable research capacity and robust health research enterprise enhanced by protection of researcher time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: Clinical and academic research centers (institutional level policy and funding support, research training programs); HMC (Medical Performance Improvement Programme); Aspetar and Aspire Academy: provide this to clinical and nonclinical staff Users: Public-sector health professionals—e.g., SCH—policy and funding support for public-sector staff training Enabler: QNRF, Primary Care Corporation (funding support, research training programs) Regulator: Primary Care Corporation</td>
</tr>
<tr>
<td>Actions</td>
<td>Immediate (2012–2013): Provide policy support at institutional level for (1) protected researcher time, (2) research training (QU as exemplar), and (3) continuing education. Provide funding support at institutional level to support this extra (protected) time for research training and research Provide policy and funding support from research funding entities (Clarify that an individual researcher participating in one or more proposals cannot claim more than 40 hours per week total for work and research) Build on existing efforts to enhance joint research training (e.g., QU short courses for clinical researchers). Establish research fellowships (e.g., clinical researcher fellowship, policy researcher fellowship) Ensure training of technical research support staff (e.g., laboratory technicians) Implement Qatar Leadership Training Program for research leadership training Evaluate the research training already under way across institutions Medium term (2–5 years): Note that physician research training also enhances clinical practice Develop incentives (e.g., clear career pathways) to attract students to technical research support programs Develop mechanisms to facilitate inter institutional mentorship Seek ways to build a culture of research by giving medical students and other students even earlier mentorship and access to research</td>
</tr>
<tr>
<td>KPIs</td>
<td>Immediate (2012–2013): Number of institutions providing research training, number Qatari/non-Qatari researchers trained per year, number or percentage of researchers with at least 10% (or other specified amount) of time protected for research, number of research fellows trained per year, number of short courses and trainees, resources supporting protected researcher time</td>
</tr>
<tr>
<td>Challenges</td>
<td>Opportunity costs of institutional funding for research training and</td>
</tr>
</tbody>
</table>
research time diverted from service provision
Governance and reporting
### Pillar: Health

#### Planning Area: Enabling Platforms

**Objective HE.2.6: Advance e-health research and implementation**

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Greater integration between different clinical information systems, and introduction of innovative e-health applications that improve the health care delivery process</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: QCRI; health care facilities: Sidra and HMC, PHCs; QSTP and tenants (research to advance e-health technologies, applications, e.g., QSTP’s RASAD health monitoring platform for remote monitoring); ictQatar, QMIC  
Enabler: QNRF, QSTP  
Users: All health care providers, research centers and general community who utilize e-health technologies and applications  
Regulator: SCH |
| Actions | Immediate (2012–2013): Develop and Implement national interoperability framework (ensure that Sidra and HMC develop an informatics platform for e-health and biomedical research architecture)  
Focus on utilizing the EHR and other clinical data as a source for the research system  
Establish informatics systems to support clinical trials  
Medium term (2–5 years): Develop expertise in the continuum between e-health and bioinformatics: Integrate national health and biomedical research information infrastructure |
| KPIs | Immediate (2012–2013): Technology platforms developed and applications developed, patented, published in scientific journals, or commercialized  
Development of an appropriate IP strategy  
Expansion of existing RASAD services |
| Challenges | Poor coordination and potential duplication of efforts (note that these can be overcome with appropriate coordination under this strategy)  
Limited number of workers worldwide with sufficient knowledge; appropriate business models and agreements with leading institutions worldwide are possible to maximize productivity and enhance specialization |
<table>
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<tr>
<th>Pillar: Health</th>
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<tbody>
<tr>
<td><strong>Planning Area:</strong></td>
<td><strong>Objective HE.2.7:</strong> (New/crosscutting) 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</td>
</tr>
<tr>
<td><strong>Enabling Platforms</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Specific Aim</strong></td>
<td>Platforms to enable a wide range of relevant biomedical research in Qatar</td>
</tr>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Researchers and developers: QBRI, WCMC-Q, Shaffalah, QCRI, HMC, Biobank Qatar, Qatar Cardiovascular Research Center, Qatar University, Sidra</td>
</tr>
<tr>
<td></td>
<td>Enabler: Funding entities (QF)</td>
</tr>
<tr>
<td></td>
<td>Users: Entire research community in Qatar</td>
</tr>
<tr>
<td></td>
<td>Regulator: SCH</td>
</tr>
<tr>
<td><strong>Actions</strong></td>
<td>Immediate (2012–2013): Develop plans and take concrete actions to develop and use all of these platforms</td>
</tr>
<tr>
<td></td>
<td>Medium term (2–5 years): Continue to develop the vivarium</td>
</tr>
<tr>
<td><strong>KPIs</strong></td>
<td>Immediate (2012–2013): Plan developed for each specified platform</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Objective HE.2.8: (New) Develop an efficient regulatory framework to govern the ethical conduct of medical research

### Specific Aim
High-quality research directed at improving the effectiveness and quality of health care
Protection of the safety and well-being of subjects involved in research
Improve the quality of life for patients via promotion of clinical effectiveness research in a safe and ethical environment
Ensure that the institutional review committees and the DSMB committee are independent at the project and institutional levels
Act as role model for the Arab region in the area of research governance

### Key Stakeholders
- **Researcher or developer:** Private and public research entities, HMC, QF research entities, QU, BioBank, VHB, Aspetar, ADL, QNRF, QSTP, funding entities
- **Enabler:** SCH, all research entities
- **Regulator:** SCH

### Actions
**Immediate (2012–2013):**
- Pass the human subject protection law
- Develop a legislative act for the use of surplus IVF in stem-cell research
- Maintain a clear process for IRB registration and institutional assurance
- Update and implement the framework of the ethical conduct of clinical trial

**Medium term (2–5 years):**
- Continue work with research entities to develop policies and appropriate governance arrangement that maintain human research ethics
- Develop a national registry of stem-cell lines and clinical trials
- Implement a monitoring system for IRB oversight and clinical research data integrity
- Allocate public fund for the establishment of centralized independent IRB committee for vulnerable subjects and an independent DSMB committee
- Implement appropriate standards of animal welfare in research
- Provide regular training and education on research bioethics
- Review and update, on annual basis, the regulatory framework of Qatar biological banks, such as Qatar Biobank and VHB
- Work regularly with QNRF to obtain ethical assurances from Qatari-funded foreign research institutions

### KPIs
**Immediate (2012–2013):**
- Release of human subject protection law
- Enact stem-cell legislation
- Increase awareness of research ethics
- Reduce the bureaucracy involved in regulatory approval
- Increase the number of participants in community-based research
- Increase the number of clinical trials
- Worldwide recognitions of Qatar research governance model

### Challenges
- Lack of human resources
- Lack of funds
APPENDIX E: Social Sciences, Arts, and Humanities Aims, Actors, Actions, Accountability, and Challenges
Objective SAH.1.1: Develop a knowledge base in science of learning, including but not limited to

- K–12 educational development and impact factors related to student achievement
- teacher training and development
- teaching and learning strategies and impact on student achievement
- role of leadership in teaching
- postsecondary learning in Qatar
- arts education methods in K–12 education
- e-learning applications
- language learning
- economics of education and training
- incentive structures affecting supply and demand for education
- human motivation in education and the workforce

Specific Aim

Improve educational outcomes, learning, and opportunities in Qatar; prepare individuals to be part of a knowledge-based and informed society; meet labor market needs in Qatar; foster a strong sense of citizenship, community, and loyalty

Key Stakeholders

Researcher or developer: QU, QF, DIIFSD, Education City universities, SESRI
Enablers: Funding entities, SEC, QF, Office of Her Highness, GSDP, QSTP’s Loghati project (for e-learning applications)
Users: SEC, SCFA, MoL, Qatar’s citizens and residents, universities, employers
Regulator: SEC, QF

Actions

Immediate (2012–2013):
Assess what research is available about education in Qatar.
Develop a coordinated 5-year education research framework and master plan
Create continuity and collaboration among stakeholders
Focus on new research trends that meet national, regional, and international standards

Medium term (2–5 years):
Conduct longitudinal study of education over 20 years

KPIs

Immediate (2012–2013):
Coordinated 5-year R&D plan documented
Number of meetings of research stakeholders
Consultations with policy community about needs

Challenges

Human resources, in particular international expertise
Political commitment
Funding
Lack of tradition of research
### Pillar: Social Sciences, Arts, and Humanities

#### Planning Area: Society: Family and Gender

**Objective SAH.1.2:** Develop a knowledge base in families and gender issues, including but not limited to

- social dimensions of health and well-being
- family formation and relations
- youth dynamics
- issues particular to women
- issues particular to men
- intergenerational solidarity
- impact of wealth on families
- empowerment of youth and women
- the role of the family in children’s development
- changes in Qatari demographic behaviors
- vulnerable groups
- child- and gender-based violence
- gender disparity
- knowledge development for mental health and older adults
- improve measures of group effectiveness
- knowledge development of family social behavior
- establishing health and healthy communities
- gender analysis and human rights
- family and lifestyle diversity

### Specific Aim

Strengthen families and expand equal opportunities for men and women in Qatar; better understand the relationship between Qatari society and globalization and modernity; provide an evidence base for policymaking

### Key Stakeholders

- **Researcher or developer:** QU (SESRI), Education City universities, DIIFSD, SESRI, QF, QSA
- **Enablers:** Funding entities, QNRF, Social Development Center, GSDP
- **Users:** SCFA, SEC, families in Qatar
- **Regulator:** Amiri Diwan, SCFA, QF

### Actions

**Immediate (2012–2013):**

Develop a coordinated 5-year research plan that considers

- an assessment of available research about families in Qatar
- the research and evidence needs of the policy community

Gain buy-in about the importance of family research from Qatari society

**Medium term (2–5 years):**

Historical study about similar societies that have undergone similar transitions

### KPIs

**Immediate (2012–2013):**

- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders
<table>
<thead>
<tr>
<th>Challenges</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources, in particular international expertise</td>
<td>Political commitment</td>
</tr>
<tr>
<td>Funding</td>
<td>Lack of tradition of research</td>
</tr>
<tr>
<td>Lack of communication among stakeholders</td>
<td>Nationals are a minority in Qatar</td>
</tr>
<tr>
<td>High turnover among the population makes studies challenging</td>
<td></td>
</tr>
</tbody>
</table>
### Pillar: Social Sciences, Arts, and Humanities

#### Planning Area: Society: Labor and Migration

**Objective SAH.1.3:** Develop a knowledge base in labor and migration in Qatar and the Gulf, including but not limited to

- patterns of immigration
- challenges of immigrant life
- impact of immigration on local communities
- sociology, economics, and politics of migration
- migrant laborers
- predicting causes and consequences of human migration
- predicting directions for immigration

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Better understand the impact of migration on society and culture in Qatar; provide an evidence base for policymaking; improve circumstances of all who work in Qatar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Stakeholders</strong></td>
<td>Researcher or developer: SESRI (QU), Center of Design Innovation, QF, ROTA, QU&lt;br&gt;Enablers: Funding entities, MoI, MoL, QNRF, GSDP&lt;br&gt;Users: QSA, MoL, Mol, QF, ROTA, QU, construction companies, other employers, employees in Qatar&lt;br&gt;Regulator: MoL, Mol, Amiri Diwan</td>
</tr>
<tr>
<td><strong>Actions</strong></td>
<td>Immediate (2012–2013): &lt;br&gt;Develop a coordinated 5-year research plan that includes&lt;br&gt;• an assessment of research that has already been conducted on this issue&lt;br&gt;• mechanisms to coordinate research stakeholders&lt;br&gt;• mapping the legal framework for this issue for policymaking and planning&lt;br&gt;Conduct comparative studies on international and regional labor policies</td>
</tr>
<tr>
<td><strong>KPIs</strong></td>
<td>Immediate (2012–2013): &lt;br&gt;Coordinated 5-year research plan documented&lt;br&gt;Regular meetings of research stakeholders&lt;br&gt;Consultations with policy community about needs&lt;br&gt;Research projects and programs aligned with QNRS that focus on meeting societal needs and issues&lt;br&gt;Research collaboration and partnership with major stakeholders</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>Human resources, in particular international expertise&lt;br&gt;Political commitment&lt;br&gt;Funding&lt;br&gt;Lack of tradition of research&lt;br&gt;Lack of communication among stakeholders&lt;br&gt;International attention on Qatar because of regional sporting events and other activities</td>
</tr>
</tbody>
</table>
## Pillar: Social Sciences, Arts, and Humanities

### Planning Area:  
**Culture: Culture, Society, Language, and Identity**

### Objective SAH.2.1: Develop a knowledge base in the development of culture in Qatar and the Gulf, including but not limited to

- impact of globalization on identity and values
- cultural production, arts, and social change through time
- cultural industries, imports, and exports
- history, arts, and heritage
- linguistics and semiotics
- Islam in contemporary life, economic society, and global affairs
- social change and identity, including values and social responsibility
- culture and human behavior shaping and modification
- improving measures of culture diversity and human rights
- culture and knowledge systems
- human behavior across culture, language, identity, and time
- impact of multidisciplinary culture on human behavior shaping and modification

### Specific Aim

Strengthen self-awareness as individuals and as a society; develop better knowledge about culture; create cultural exchanges with other countries

### Key Stakeholders

Researcher or developer: VCUQatar, QU, Education City universities, QMA, Ministry of Culture, SEC, QSA, SESRI, DIIFSD, SCFA, UCL Qatar, QFIS  
Enablers: Funding entities, HHO Amiri Diwan, Ministry of Culture, QNRF, QSTP (Loghati), GSDP  
Users: tourism authority, General Directorate of Endowments (Awqaf), museums, Katara Foundation, citizens  
Regulator: Amiri Diwan, QF, Ministry of Culture

### Actions

**Immediate (2012–2013):**

- Develop a coordinated 5-year research plan
- Create an archive of research and dissertations
- Develop external partnerships
- Create publicity, printed or online
- Hold conferences and symposia
- Create online lectures
- Promote educational programs
- Develop databases about cultural activities
- Purchase and exhibit

### KPIs

**Immediate (2012–2013):**

- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders

### Challenges

- Lack of coordination among multiple stakeholders
- Lack of human resources and capacities
- Access to primary materials
### Objective SAH.2.2: Develop a knowledge base in the impact of social, printed, and broadcast media on the Gulf and the world, including but not limited to the impact of media on
- politics
- economics
- families
- information and media literacy skills
- active citizenship

### Specific Aim
Promote positive evolution of the media; better understand the internal and external impact of media; foster excellent communication of research to various audiences

### Key Stakeholders
- **Researcher or developer:** NU-Q, Vodafone, Q broadcasting, Georgetown University, Brookings, QU Department of Mass Communication, SESRI (QU), QFIS
- **Enablers:** Funding entities, QNRF, ictQatar, Qtel
- **Users:** Qtel, QU, Al Jazeera, ITU, QSTP, Q-Media, ictQatar, Vodafone, Q broadcasting
- **Regulator:** Q-Media, ictQatar, MoFA, MoI, Amiri Diwan

### Actions
**Immediate (2012–2013):**
- Develop a coordinated 5-year research plan
- International benchmarking of media, social media, and communication initiatives
- Review external social media, media, and communication organizations and how they operate within Qatar

### KPIs
**Immediate (2012–2013):**
- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders
- Cutting-edge research recognized by international scientific communities

### Challenges
- Lack of capacity
- Lack of access to primary information
<table>
<thead>
<tr>
<th><strong>Planning Area: Culture: Arts and Design</strong></th>
<th><strong>Objective SAH.2.3:</strong> Promote and study creativity, the arts, and design including but not limited to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- creative practice</td>
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<td>- cultural production as economic and social drivers</td>
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<td>- programs to enhance arts appreciation and arts advocacy</td>
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<td>- design for social benefits</td>
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<td>- translational research and community development</td>
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<td>- data visualization</td>
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<td></td>
<td>- developing creativity skills</td>
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<td></td>
<td>- knowledge development for visual literacy and quantitative reasoning</td>
</tr>
</tbody>
</table>

| **Specific Aim** | Create better awareness of local artists and designers; cultivate a creative cultural environment in Qatar; export arts, design, and culture from Qatar |
| **Key Stakeholders** | Researcher or developer: QMA, Katara, VCU Qatar, UCL Qatar, QFIS |
| | Enablers: Funding entities, QNRF, SEC, QSTP, GSDP |
| | Users: QMA, Awqaf, Katara, companies |
| | Regulator: Office of Her Highness, QF, tourism authority, Ministry of Culture, SEC |

| **Actions** | Immediate (2012–2013): |
| | Develop a coordinated 5-year research plan |
| | Design curriculum for arts and designs education in K–12 |
| | Develop programs at museums |
| | Create places for artists in society |

| **KPIs** | Immediate (2012–2013): |
| | Coordinated 5-year research plan documented |
| | Regular meetings of research stakeholders |
| | Consultations with policy community about needs |
| | Research projects and programs aligned with QNRS that focus on meeting societal needs and issues |
| | Research collaboration and partnership with major stakeholders |

| **Challenges** | Lack of policies |
| | Lack of arts in K–12 |
| | Access to primary materials |
| | Lack of coordination among multiple stakeholders |
| | Lack of human resources and capacity |
### Pillar: Social Sciences, Arts, and Humanities

#### Planning Area: Culture: Sports

**Objective SAH.2.4:** Develop a knowledge base in sports in Qatar, including but not limited to

- impact of hosting large sporting events
- sports, health, and lifestyle
- how to increase participation in sports
- building interactive sport information system
- safeguarding major international sporting events
- developing integrated sport security, safety, and integrity systems

| Specific Aim | Better understand and manage the impact of sports mega events on society, individuals, the economy, infrastructure, attitudes, identity, and social values; increase participation in sports; positively affect the population’s lifestyle and health through sports; provide an evidence base for policymaking |
| Key Stakeholders | Researcher or developer: QU Sport Science Program, SESRI (QU), Aspetar, QF research institutes, QOC, SCH, SEC, HMC Enablers: Funding entities, QOC, QNRF, GSDP, QSTP (RASAD), ICSS Users: SEC, QSA, QSTP, QOC, SEC, SCH, Qatar 2022 Supreme Committee Regulator: QOC, SEC, SCH |
| Actions | Immediate (2012–2013): Develop a coordinated 5-year research plan Conduct a sports participation survey Study sports qualitatively Conduct cutting-edge research in all aspects of sports security, safety, integrity, and socioeconomic legacy of major international sports events |
| KPIs | Immediate (2012–2013): Coordinated 5-year research plan documented Regular meetings of research stakeholders Consultations with policy community about needs Completion of sports participation survey Research projects and programs aligned with QNRS that focus on meeting societal needs and issues Research collaboration and partnership with major stakeholders |
| Challenges | Human resources, in particular international expertise Political commitment Funding Lack of tradition of research Lack of communication among stakeholders Mega sporting events take a long time to plan |
# Qatar National Research Strategy

## Pillar: Social Sciences, Arts, and Humanities

### Planning Area:

#### Public and Economic Life:

#### International Affairs

**Objective SAH.3.1:** Develop a knowledge base in international affairs that are relevant to Qatar, including but not limited to

- small states and international diplomacy
- geopolitics and geo-economics of energy
- the Gulf and Asia
- political economy
- climate change and energy politics
- prediction of international economy trends
- implications of international law
- developing an international legal framework for illegal match fixing in international sports events

### Specific Aim

Enhance Qatar’s ability to anticipate and manage the challenges, opportunities, and risks of the international community in the 21st century.

### Key Stakeholders

- Researcher or developer: Georgetown University in Qatar, Aljazeera Studies Center, Diplomatic Institute at MoFA, Amiri Diwan, QU Department of International Affairs, SESRI (QU), RUSI, diplomatic representatives in Qatar, Brookings, Arabic Studies Center, QFIS, ICSS, Sorbonne University
- Enablers: Funding entities, Amiri Diwan, MoFA
- Users: MoFA, Amiri Diwan, MoBT, QFC, QIA
- Regulator: Amiri Diwan, MoFA

### Actions

**Immediate (2012–2013):**

- Develop a coordinated 5-year research plan

**Medium term (2–5 years):**

- Standardize best practice
- Selection of research proposals based on merit and peer review
- Adopt a multidisciplinary approach to the research
- Create a Ph.D. program in international affairs

### KPIs

**Immediate (2012–2013):**

- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders

### Challenges

- Access to data
- Transparency
- Critical mass of faculty and students
| Specific Aim | Enhance public services and strengthen interface between civil society and government; serve the public interest through public policy; provide an evidence base for policymaking; create regulations based on best practice |
| Key Stakeholders | Researcher or developer: RQPI, QU (College of Law or College of Business and Economics), QSA, GSDP, QF, Georgetown University in Qatar, QFIS, HBKU  
Enablers: Funding entities, Amiri Diwan, QNRF, QF, GSDP  
Users: All public institutions in Qatar, organizations, citizens  
Regulator: Amiri Diwan, general secretary of the council of ministers |
| Actions | Immediate (2012–2013):  
Develop a coordinated 5-year research plan.  
Develop public-sector competencies.  
KPIs | Immediate (2012–2013):  
Coordinated 5-year research plan documented  
Regular meetings of research stakeholders  
Consultations with policy community about needs  
Research projects and programs aligned with QNRS that focus on meeting societal needs and issues  
Research collaboration and partnership with major stakeholders  
Challenges | Low knowledge in the public sector  
Knowledge performance and accountability  
Low level of engagement of the public sector |

**Objective SAH.3.2:** Support the development of public policy, governance, and regulation in Qatar, including but not limited to  
- effective public institutions  
- legal and economic environment for diversity  
- cultural and Islamic practice in law  
- arts policy and practice  
- e-governance  
- national policy for social care and global issues
### Pillar: Social Sciences, Arts, and Humanities

### Planning Area: Public and Economic Life: Business and Innovation

#### Objective SAH.3.3: Develop a knowledge base in business and innovation in Qatar, including but not limited to

- entrepreneurship
- innovation practices, ecosystems, and knowledge for diversification
- family businesses
- leadership, management styles, and governance systems
- e-business
- strategy of emerging multinationals
- corporate identity and communication
- corporate and financial law
- social values and corporate social responsibility
- consumer financial behavior
- Islamic finance
- small businesses and workforce rights and protection
- contributions of older Qataris to Qatar economy
- time management in a dynamic working environment

### Specific Aim

Create a better understanding of the obstacles and levers for enriching Qatar’s economic, business, trade, and innovation fabric

### Key Stakeholders

- Researcher or developer: HEC Paris in Qatar, QSTP, Silatech, CMUQ, QF, QSA, QU (College of Business and Economics), Social Development Center, QFIS
- Enablers: Funding entities, QP, Qtel, Enterprise Qatar, QCCI, Central Bank of Qatar, Qatar Leadership Center, QSTP, GSDP
- Users: QDB, QIA, Central Bank of Qatar, Amiri Diwan, MoBT, MoEF, QCCI
- Regulator: QDB, QIA, Amiri Diwan

### Actions

**Immediate (2012–2013):**
- Develop a coordinated 5-year research plan
- Medium term (2–5 years):
  - Develop executive education and training
  - Develop case studies
  - Hire permanent faculty in these areas in Qatar’s universities
  - Balance funding between programs and projects

### KPIs

**Immediate (2012–2013):**
- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Start and completion of items listed in “Actions”
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders

### Challenges

- A weak national private sector
- Obstacles to easily starting a business in Qatar
- Low knowledge in the public sector
- Knowledge performance and accountability
- Low level of engagement of the public sector
## Pillar: Social Sciences, Arts, and Humanities

### Planning Area: Public and Economic Life
#### Economics

<table>
<thead>
<tr>
<th>Objective SAH.3.4: Develop a knowledge base in economics relevant to Qatar and the Gulf, including but not limited to</th>
</tr>
</thead>
<tbody>
<tr>
<td>• natural resource management</td>
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<tr>
<td>• energy economics</td>
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<tr>
<td>• environmental economics</td>
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<tr>
<td>• public financial management</td>
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<tr>
<td>• capital and financial market development</td>
</tr>
<tr>
<td>• economics of globalization and local markets</td>
</tr>
<tr>
<td>• economics of innovation, discovery, and diversification</td>
</tr>
<tr>
<td>• consumer financial behavior</td>
</tr>
<tr>
<td>• corporate and financial law</td>
</tr>
</tbody>
</table>

| Specific Aim | Promote a prosperous, stable, and sustainable economy; create discovery, knowledge, innovation, and diversification of the economy through economic analysis |
| Key Stakeholders | Researchers and developers: QU College of Business and Economics, QF, Georgetown University in Qatar, HEC Paris, CMUQ, QSA, QSTP (for natural resource management), QFIS |
| Enablers | Funding entities, MoEF, MoBT, QCCI, General Secretary of the Council of Ministers, GSDP |
| Users | Amiri Diwan, MoBT, MoEF, QCCI, GSPD, QF, private sector |
| Regulator | MoEF, MoBT, QCCI, Amiri Diwan, General Secretary of the Council of Ministers, GSDP |

| Actions | Immediate (2012–2013): Develop a coordinated 5-year research plan |
| Medium term (2–5 years): | Develop undergraduate program in economics and finance |
| | Develop capacity in resources and environmental economics that address interactions between energy, water, land, and people |
| | Develop capacity in management and regulation economics, including areas that address public finance, business trade, capital and financial markets, and business trade and investment |
| | Create a center of excellence in applied economics |

| KPIs | Immediate (2012–2013): Coordinated 5-year research plan documented |
| | Regular meetings of research stakeholders |
| | Consultations with policy community about needs |
| | Research projects and programs aligned with QNRS that focus on meeting societal needs and issues |
| | Research collaboration and partnership with major stakeholders |

| Challenges | Human resources, in particular demand-driven international expertise |
| | Political awareness of utility of economics research |
| | Funding |
| | Lack of tradition of research |
| | Lack of communication among stakeholders |
**Objective SAH.3.5:** Develop a knowledge base in public safety and security in Qatar, including but not limited to
- water management and access to water
- food security
- road safety
- community safety and security
- sport security, safety, and integrity

**Specific Aim**
Provide an evidence base for policymakers for to support a safe and secure society

**Key Stakeholders**
Researchers and developers: RQPI, MoI, QU, QF, QCRI, Georgetown University in Qatar, QSTP members (including, but not limited to, Williams Grand Prix Engineering B and TRL)
Enablers: Funding entities, Amiri Diwan, MoI, MoE, QSTP, ICSS
Users: MoI, MoFA, UPDA, Ashghal, Amiri Diwan, QF, QNFSP, MoE, QP, GSDP
Regulator: Amiri Diwan, General Secretary of the Council of Ministers, GSDP

**Actions**
Immediate (2012–2013):
- Develop a coordinated 5-year R&D plan with researchers in other relevant sectors, for a multidisciplinary approach
- Conduct cutting-edge research in all aspects of sports security, safety, integrity, and the socioeconomic legacy of major international sports events
- Develop and share best practices related to sport security, safety, and integrity
- Align national economic development and competitiveness with national security and investments in security and safety measures for safeguarding major international sporting events

**KPIs**
Immediate (2012–2013):
- Coordinated 5-year R&D plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders
- Research projects and programs aligned with the national economic and security requirements

**Challenges**
Funding
Researchers
Supportive policy environment
A clear set of national goals and direction
Coordination with research in other relevant sectors
### Pillar: Social Sciences, Arts, and Humanities

**Planning Area:** Public and Economic Life: Urban Development and Planning

**Objective SAH.3.6:** Apply social science to urban development and planning in Qatar and the Gulf region, including but not limited to
- building design
- transportation
- spatial analysis for social prosperity
- social values and corporate social responsibility
- corporate identity and communication
- emergent city planning

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Develop Doha as a best-practice, healthy, functional city and society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Stakeholders</td>
<td>Researchers and developers: College of Engineering and SESRI (QU), Ashghal, UPDA, QU, Texas A&amp;M University at Qatar, QFIS, VCUQatar Enablers: Funding entities, GSDP, Amiri Diwan, QNRF</td>
</tr>
<tr>
<td>Users:</td>
<td>Ashghal, UPDA, Diar, Barwa, Mushaireb, Qatar Rail</td>
</tr>
<tr>
<td>Regulator:</td>
<td>UPDA, Amiri Diwan, Museum of Modern Art</td>
</tr>
</tbody>
</table>

**Actions**
Immediate (2012–2013):
- Develop a coordinated 5-year research plan
- Research best practice internationally
- Apply historical analysis to cities in the Middle East
- Focus on contemporary applications and preservation of identity

**KPIs**
Immediate (2012–2013):
- Coordinated 5-year research plan documented
- Regular meetings of research stakeholders
- Consultations with policy community about needs
- Research projects and programs aligned with QNRS that focus on meeting societal needs and issues
- Research collaboration and partnership with major stakeholders

**Challenges**
- Policies
- Heritage protection
- Ownership
### Pillar: Social Sciences, Arts, and Humanities

<table>
<thead>
<tr>
<th>Planning Area: Capabilities, Collaboration, and Crosscutting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective SAH.4.1:</strong> Develop the existing capacity for research in SAH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Develop capacity to conduct research in the social sciences, arts, and humanities</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Key Stakeholders</th>
<th>Researchers and developers: Research community in Qatar</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Enablers: QF president for R&amp;D, universities in Qatar, GSDP</th>
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<table>
<thead>
<tr>
<th>Users: Research and policy community in Qatar</th>
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<tr>
<th>Regulator: QF</th>
</tr>
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<table>
<thead>
<tr>
<th>Actions</th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a plan to strengthen existing capacities that includes</td>
<td></td>
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<tr>
<td>• assessment of existing capacity for SAH research</td>
<td></td>
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<tr>
<td>• assessment of whether new institutions or university programs are needed</td>
<td></td>
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<tr>
<td>• development of capacity-building strategies</td>
<td></td>
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<tr>
<td>• a plan for addressing data needs in social sciences, arts, and humanities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium term (2–5 years):</th>
</tr>
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<tbody>
<tr>
<td>Make decisions about how to strengthen institutional capacities</td>
</tr>
<tr>
<td>Build a network for social sciences, arts, and humanities information systems and data collection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KPIs</th>
<th>Immediate (2012–2013):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinated plan to strengthen capacity documented</td>
<td></td>
</tr>
<tr>
<td>Regular meetings of research stakeholders</td>
<td></td>
</tr>
<tr>
<td>Consultations with research community about needs</td>
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<tr>
<td>Research projects and programs aligned with QNRS that focus on meeting societal needs and issues</td>
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<tr>
<td>Research collaboration and partnerships with major stakeholders</td>
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</tbody>
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<table>
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<tr>
<th>Challenges</th>
<th>Funding</th>
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<tr>
<td>Need for coordination among stakeholders</td>
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<tr>
<td>Policy-setting authority</td>
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### Pillar: Social Sciences, Arts, and Humanities

**Objective SAH.4.2:** Develop methodological innovations, new data sources, and new measurements in SAH, including but not limited to
- creative data-mining approaches and methodologies
- data-driven strategies for research
- a shared national database for research in SAH
- a quality-of-life index for Qatar

<table>
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<tr>
<th>Specific Aim</th>
<th>Develop databases and innovative methodology to support SAH research</th>
</tr>
</thead>
</table>
| Key Stakeholders | Researchers and developers: Researchers in Qatar, QSA, SESRI  
Enablers: QSA, QNRF, QSTP  
Users: Researchers in Qatar  
Regulator: QSA, QF |
| Actions | Immediate (2012–2013):  
Develop a coordinated 5-year R&D plan  
Organize and host both substantive and methodological workshops in SAH  
Medium term  
Create a shared national database for research in SAH  
Develop a quality-of-life index for Qatar |
| KPIs | Immediate (2012–2013):  
Coordinated 5-year R&D plan documented  
Regular meetings of research stakeholders  
Consultations with research community about needs |
| Challenges | Funding  
Need for coordination among stakeholders  
Policy-setting authority  
Lack of human subject protection policies |
### Pillar: Social Sciences, Arts, and Humanities

#### Planning Area: Capabilities, Collaboration, and Crosscutting

| Specific Aim | Expand access to research materials for Arabic-speaking researchers. |
| Key Stakeholders | Researchers and developers: QF, universities in Qatar, SEC, SESRI  
Enablers: QCRI, QFIS, ictQatar, QNRF, QSTP-Loghati  
Users: Researchers in Qatar, residents in Qatar  
Regulator: ictQatar, QF |
| Actions | Immediate (2012–2013):  
Assess which areas of social science research in Qatar would benefit from enhanced English–Arabic facilitation  
Coordinate with the ICT efforts at Arabic-language media  
Medium term  
Create a plan to meet the English–Arabic gaps, based on the assessment |
| KPIs | Immediate (2012–2013):  
Assessment of English–Arabic translation needs completed and documented  
Regular meetings of research stakeholders  
Consultations with research community about needs |
| Challenges | Funding  
Need for coordination among stakeholders  
Policy-setting authority |