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In the half-decade since its launch in 2006, the Qatar National Research Fund (QNRF) has become a vital part of a national vision that sees research as a means of securing economic and educational gains—of generally creating positive change—both in Qatar and in the Gulf region. Established by the Qatar Foundation for Education, Science and Community Development (QF), QNRF awards research grants to recipients at all levels, from undergraduate to professional, in a wide range of disciplines in Qatar and abroad. Its flagship program is the National Priorities Research Program (NPRP), which has distributed $345 million in grants thus far to professional research teams. The smaller Undergraduate Research Experience Program (UREP) is also a multimillion-dollar endeavor, having enabled more than 1,100 undergraduates in Qatar’s universities to participate in faculty-led research projects. These and future efforts seek to build domestic research capability and cultivate what the QF leadership refers to as a Qatari “research culture”—a concept with an illustrious precedent in the Golden Age of Arab-Islamic science during the 9th and 10th centuries.

The first five years of QNRF’s existence have also brought changes that have significantly expanded, at least in principle, its original mandate. In 2008, the Amir of Qatar, His Highness Sheikh Hamad bin Khalifa Al-Thani, issued Decree-Law No. (24) of 2008, which raised Qatar’s annual investment in research and development (R&D) to 2.8 percent of total annual government revenue and announced at the same time a new institution: the Qatar Foundation for the Support of Scientific Research (QFSSR), which was tasked with setting national priorities for spending this investment over time. The new law made QNRF the QFSSR’s implementation arm, responsible for carrying out the decisions of the QFSSR’s board of directors and administering funding for board-approved R&D projects.

This legislation has not yet been implemented, but the relationship it envisions between the QFSSR and QNRF, as well as the future role it suggests QNRF will have to play in developing and managing external sources of funding for research, raises QNRF’s profile appreciably, potentially requiring it to operate at the highest levels of the Qatari government and giving it unprecedented visibility. In addition, the total amounts of funding QNRF could conceivably be managing are an order of magnitude larger than its original funding. Thus, QNRF not only will need to continue performing all of its previous tasks but also may need, at some point in the future, to take on numerous new tasks, many outside the scope of its previous experience. These are demands that QNRF’s early planners did not anticipate.

In view of the fund’s potentially changing role, QF wanted to determine what might be needed to ensure its sustainability in the decades to come, and QF’s leadership engaged the RAND-Qatar Policy Institute (RQPI) to investigate this issue. Following systematic analysis of the issue, RQPI provided a twofold response: QNRF will need to (1) make measurable progress toward achieving its core mission of fostering a research culture in Qatar and (2) evolve its governance structure and related infrastructure to accommodate potential new responsibilities.
Pursuing a multi-method approach, RQPI assessed how well QNRF has done to date on both counts. This report presents RQPI’s recommendations for how best to continue pursuing these parallel objectives well into the future.

The Need for QNRF to Make Measurable Progress Toward Fostering a Research Culture in Qatar

In RQPI’s assessment, measurement is the essential requirement for QNRF sustainability in making progress toward establishing a Qatari research culture. The key to constructive measurement is informative metrics directly linked to QNRF’s goals. QF’s concept of a contemporary research culture in Qatar is novel—there is no widely agreed-upon definition of this notion (as opposed to “culture” more broadly) either among researchers or in the available literature. RQPI’s first task, then, was to define the concept. The definition offered is a working one that lays a solid foundation at this early stage in QNRF’s development and points directly to metrics. QNRF is young, and building a research culture is an ambitious, long-term endeavor; consequently, this definition will inevitably need to be refined over time.

A Working Definition of a Qatari Research Culture

RQPI’s working definition of a Qatari research culture encompasses three sets of characteristics of a shared community of researchers: attitudes and beliefs, symbols, and resources (Figure S.1). The first two of these are considered by many cultural anthropologists to be core elements of any culture. The Qatari research culture will have attitudes, beliefs, and symbols particular to research and to Qatar. Resources are not a part of cultural anthropological discourse, but they are essential to a research culture.

Figure S.1
Characteristics of a Research Culture

[Diagram of Attitudes and beliefs, Symbols, and Resources]

1 Methods included interviews, surveys of international best practices, benchmarking, literature reviews, and analysis of existing data from QNRF programs. The RQPI team also drew on the deep firsthand knowledge of QNRF’s structure, organization, and administration it has gained over five years of working closely with QF and QNRF.
This working definition applies primarily to the research community centered in Qatar University and Education City, the community in which the fledgling QNRF can produce measurable accomplishments and in which a Qatari research culture will begin to thrive. If, after this initial research culture is well established, there is a desire to foster a broader national Qatari research culture, this community will form its core.

There are many specific examples of each of the sets of characteristics in the working definition. These examples will become evident as the Qatari research culture takes shape. When the culture is thriving, all will be present. The overarching goal is to be able to measure each characteristic to be able to develop it further.

**Attitudes and Beliefs.** This set of characteristics relates to how and what members of the research community think, what they value, and how they behave as part of a collective society. A flourishing research culture in Qatar will encompass the following attitudes and beliefs:

- Researchers emphasizing common priorities
- Researchers agreeing on the need for quality-assurance processes to ensure the highest-quality research
- Participants in the research culture in Qatar gaining a sense of esteem from being a part of the research community
- High levels of job satisfaction unique to participants’ experience in Qatar
- Commitment to the Qatari research culture and community.

**Symbols.** The set of symbols includes items and markers that members of the Qatari research community use and value equally. Symbols are evidence of the research culture’s attitudes and beliefs. A thriving research culture in Qatar will contain the following symbols:

- Research being funded and carried out and innovations created that directly address problems of interest to Qatar, the region, or the world, enhancing life and the environment
- QNRF grant programs attracting substantial numbers of applications, as many as possible led by Qatari principal investigators (PIs)
- Research teams publishing completed research
- Qatar’s international research profile rising
- Human capital being built within the research community
- Students engaged in research receiving good mentoring and participating in research-related activities.

**Resources.** The resources of a research culture include the material and physical assets that make the culture operational. A thriving research culture in Qatar will have the following resources:

- Committed local institutions
- Financial stability and sustainability
- Professional researchers
- Research infrastructure (e.g., equipment, facilities).
Metrics for Assessing QNRF’s Progress Toward Developing a Qatari Research Culture

The metrics QNRF should use to measure its progress in building a Qatari research culture should stem directly from the sets of characteristics. QNRF has already begun to take some measurements, and it should start taking others as soon as possible. Not every characteristic of a Qatari research culture has clear metrics at this time, but by measuring those that do, QNRF can gain insights to increase its ability to measure progress.

**Metrics to Measure Attitudes and Beliefs.** To measure the sense of esteem that participants gain from being a part of Qatar’s collaborative research community, QNRF can use “referent identification,” that is, the researchers to whom the members of the community compare themselves. Perception surveys that indicate that Qatari respondents perceive themselves to be the equals of members of other esteemed research communities would indicate that Qatar’s research culture is taking hold. QNRF could add questions to its online surveys to measure the sense of esteem mentors, students, and others gain from being part of the UREP, NPRP, and the larger Qatari research community. Similar surveys could be administered to other key groups.

**Metrics to Measure Symbols.** To measure the degree to which QNRF is funding successful research that directly addresses problems of interest to Qatar, the region, or the world, QNRF can

- Conduct regular surveys of the research being done in Qatar (e.g., QNRF’s current Biennial National Research Survey [BNRS])
- Use existing reporting requirements for QNRF-funded research projects to make in-progress assessments
- Require deliverables from QNRF-funded research projects.

To measure QNRF’s progress in attracting substantial numbers of high-quality applications for QNRF grant programs, QNRF can

- Gather information on the numbers of applicants and grants awarded for each program and periodically examine participation and award rates across institutions
- Examine the distribution of scores given during the peer-review processes of both the UREP and the NPRP
- Collect and analyze data on proposals.

To measure the extent to which research teams are publishing the results of completed research, QNRF will need to establish core metrics for publications in peer-reviewed journals. While QNRF does not yet take such measurements, it plans to tally the numbers of publications by QNRF-funded research teams, publications in “influential” journals, and citations of QNRF-funded publications.

QNRF can use media surveys to measure the rising international profile for Qatar as a research leader. QNRF already gathers information on the press and news-media coverage it receives. Formal analysis of these data can indicate Qatar’s status within the international research community and the influence of QNRF-funded projects.

**Metrics to Measure Resources.** To measure the extent to which a local network of high-quality research institutions and facilities involved in QNRF-sponsored research has been established, QNRF can tally the number of institutions and the amount of research facilities and equipment they have. It can benchmark the quality of the facilities and equipment against
that of other international research institutions and can survey funded researchers and grant applicants to assess whether Qatar's research infrastructure is attractive enough to draw good researchers to QNRF-funded projects.

**QNRF’s Progress to Date in Fostering a Research Culture**
The data available from metrics QNRF is already using indicate that the fund has generally done well in laying the foundation for a research culture. These metrics include assessments of the application and award processes of the NPRP and UREP, peer-review scores, and demographic information on grant applicants.

The number of students and mentors participating in the UREP has risen during each funding cycle, and more Qatari students have taken part in each successive cycle. This and the general improvement in the quality of proposals being received are solid evidence that the characteristics of a research culture have begun to take root in Qatar.

A number of Qatari PIs have submitted grant proposals to the NPRP. In the first funding cycle, however, the number was a small fraction of the total and the proposals were relatively less successful. In a flourishing Qatari research culture, QNRF will receive many high-quality applications from Qatari PIs. While QNRF has made some headway on this front, improvement is needed. QNRF should take further steps to encourage Qatari PIs to participate in the program and should help them gain experience in formulating competitive proposals.

**Future QNRF Actions to Ensure Continuing Measurable Progress**
QNRF should build on the current characteristics of a Qatari research culture, further developing them and putting other, new characteristics in place. Metrics, again, are key. QNRF already uses a number of metrics to appraise symbols and resources. The goal should be to make every characteristic measurable. Metrics to measure attitudes and beliefs should be a special focus.

Specific recommendations include the following:

- Increase measurement of research outcomes
- Base future QNRF metrics on the working definition of a Qatari research culture
- Use surveys to determine job satisfaction and commitment among researchers
- Continue to promote a social research community.

QNRF should also balance extrinsic and intrinsic motivations for researchers to participate in the Qatari research culture. Extrinsic motivations include ample available funding and salary levels. Intrinsic motivations include the sense of esteem gained from being part of the Qatari research community. When these are balanced, QNRF will attract researchers not simply because they are paid to participate in the community, but because they also want to belong to it. QNRF should create initiatives to achieve the latter, while keeping grant award levels in line with those of other organizations.

**Evolving QNRF’s Infrastructure to Accommodate New Responsibilities**

The original 2004 QNRF business plan recommended a board-based governance structure, with a start-up manager in its early stages. A permanent director was to replace the start-up
manager after the fund was established. But senior QF management modified these recommendations, deciding that an ad hoc steering committee offered advantages over a board of governors for the start-up phase. Senior management also decided to postpone appointing a permanent director and to name a director pro tem or start-up director instead, giving that person the title of Director until a full search was undertaken to fill the position.

In late 2008, after QNRF had successfully administered at least one round of both the NPRP and the UREP, senior QF management decided to move forward with the original governance model. But that same year, the Amir issued Decree-Law No. (24) of 2008. The projected expansion of QNRF’s roles and responsibilities called for in this new legislation suggested that not only the governance plan but also QNRF’s funding model, organizational structure, and staffing levels might need to be modified.

The Original Model for QNRF’s Governance

**Board of Governors.** The board-led governance model envisioned by QF was similar to that of the National Science Foundation (NSF) in the United States. The governing board was to establish QNRF’s overall direction, set policy, approve selection criteria for grant programs, and provide institutional oversight, ensuring the sound and timely implementation of QNRF’s mission and goals. QF would hold the board ultimately accountable for the performance of the NPRP, the UREP, and the BNRS. The board would also select the permanent director of QNRF, giving him or her the authority to run the fund on a day-to-day basis. The board would participate in evaluations of both its own performance and that of the fund, but it would avoid micromanagement. Typically, board members were to serve four-year terms. Members of the board were to represent the diverse subject areas that receive QNRF funding. The majority were to be Qatari nationals to help ensure that QNRF programs serve long-term national interests. Some members were to be international to encourage cross-border research collaborations and provide knowledge of international best practices. One board member was to be a QF representative, given QF’s role as QNRF’s founder and funding source. The board was to have either eight members (one for each main QNRF subject area and one to represent QF) or nine (if a chairperson was appointed). The permanent director was to be an ex officio, non-voting member who would work with the board to execute QNRF policy and planning.

Five criteria were to guide the selection of board members:

- Established reputation
- Experience in decisionmaking
- Expertise in governance and management
- Subject-matter expertise in one or more of the areas supported by QNRF programs
- Lack of apparent or perceived conflict of interest.

These criteria were intended to build confidence in the objectivity and trustworthiness of the board’s guidance.

**Permanent Director.** The QNRF director was originally intended to be responsible for both giving the fund long-term direction and managing it on a daily basis. Programmatic leadership was to be a key responsibility. The director was to implement QF’s vision for QNRF, crafting funding activities and operational plans and serving on the governing board. The director was also expected to ensure that the fund was able to fulfill its mission effectively by,
for example, hiring and supervising staff, reviewing performance and compensation, preparing periodic reports, and certifying financial statements.

Finally, the director was to be responsible for outreach, relationship building, and communications. Building bridges between various interested groups in Qatar and abroad, managing QNRF’s formal relationships with key stakeholders, and seeking and cementing funding opportunities beneficial to Qatar all fell within this area of responsibility. Communicating the fund’s research priorities and results to diverse audiences was yet another important duty.

The first permanent director was to be appointed by the QF board, and QNRF’s governing board would appoint subsequent directors. Candidates could be either Qatari or non-Qatari. The chosen candidate was to complement technical excellence with proven management, leadership, and interpersonal skills. Selection criteria were laid out in the job description. The director was to hold a Ph.D. in the sciences, engineering, the arts, or the humanities. He or she was expected to possess knowledge and experience across academic and professional disciplines and to have a strong grasp of research management. The ability to quickly understand Qatar’s research environment, society, and economy was fundamental, as were excellent ties with the international research community and strong skills in relationship building.

Evolving the Original Governance Model and Related Infrastructure to Accommodate QNRF’s Potential New Role and Responsibilities

The changes needed to ensure QNRF’s sustainability in light of Decree-Law No. (24) of 2008, as well as the likelihood that QNRF would ultimately have to develop and manage external funding of its research agenda, involve both the original governance model and the original funding model, organizational structure, and staffing plan.

**Governance Structure.** RQPI recommends that QF make two modifications to the original model for QNRF’s board of governors: The selection criteria should be revised, and individual board members should be of higher caliber than originally envisaged.

The modified criteria should specify that to avoid any conflict of interest, board members must not be potential recipients of QFSSR or other research funding external to QNRF. In addition, the subject areas in which board members have expertise should be expanded to include not just areas supported by QNRF programs but also those of programs QNRF may manage on behalf of the QFSSR or other external funders of research.

Increasing the caliber of QNRF board members will be necessary to enable the board to maintain a commensurate relationship with the QFSSR board, as well as the governing boards or other sources responsible for providing external funding for research, thus protecting QNRF’s interests and making effective negotiating efforts more likely.

As QNRF evolves, the director may have a much higher profile than was originally envisioned and considerably expanded responsibilities. Accordingly, he or she will likely need to combine two very different sets of qualifications—the ability to run a growing grant institution and the stature and experience in Qatar and abroad to manage high-level board relationships. RQPI recommends a two-person, two-position approach to this situation, if and when it arises. One director—a managing director or chief operations officer (COO)—would continue to run QNRF, while another, higher-level executive director or chief executive officer (CEO) would manage the expanded relationships of a future QNRF and interface directly with the QFSSR and other external funders of QNRF research.
Funding Model. To manage a total amount of funding an order of magnitude larger than the original amount, QNRF will need to consider alternative, and probably multiple, funding models. Alternatives include:

- Establishing a National Research Council similar to the U.S. NRC
- Establishing national laboratories
- Funding branches of international research centers
- Partnering with private sector firms in R&D
- Building new research centers at universities
- Partnering with government ministries.

Some of these options, particularly those in which funding is solely within Qatar, would be able to absorb productively only a limited amount of funding. This makes the need for multiple models more likely.

Organizational Structure. The potential magnitude of new research budgets in the future and the alternative funding models listed above suggest that QNRF will need to modify its current organizational structure. Setting up a national laboratory, for example, is very different from distributing awards for investigator-led research. There are many possibilities, and the right choice will depend on how much funding QNRF receives from the QFSSR or other external sources and the kinds of programs it is called on to implement—neither of which is yet clear. Given this uncertainty, any potential QNRF organizational structure should be highly flexible, with adaptive budgeting mechanisms, and should emphasize positions certain to be needed under nearly any scenario.

Staffing Levels. The number of QNRF staff needed will also be dictated by potentially larger budgets in the future and any new funding models adopted. An increase of QFSSR funding to approximately $0.5 billion a year, for instance, would require QNRF to at least double its staff. New QNRF staff levels, therefore, should align with the full range of the organization’s tasks: those it has undertaken in the past, those directly mandated by Decree-Law No. (24) of 2008, and those that stem indirectly from the new legislation or from other prospects for external funding.

QNRF Progress to Date in Developing Its Infrastructure

As of early 2011, Decree-Law No. (24) of 2008 had not been implemented. Most likely, this situation directly influenced the decisions of senior QF and QNRF management about whether to proceed with recommended changes to QNRF’s infrastructure. But other changes had been envisioned well before the legislation was enacted. Movement on those fronts will also be needed to ensure QNRF’s long-term sustainability.

In that regard, QNRF has made some progress in evolving its infrastructure as originally envisioned, but challenges remain. QF leadership has selected the former QNRF start-up director as the permanent director, but it has not yet established a governing board. In addition, QNRF’s funding model, organizational structure, and staffing levels remain unchanged, still geared toward investigator-driven research in clearly defined fields.

Recommendations

RQPI recommends that QF and QNRF move forward as if the 2008 legislation could become operational at any time, with all of the changes that would bring. Nine members of a new
governing board for QNRF, for example, should be required to be more highly qualified than originally envisioned. Until and unless a tangible QFSSR-QNRF relationship takes shape, the board should remain accountable to QF for program performance, and there should always be a QF representative on the board. The next steps at this point are to have QF leaders generate a candidate list and forward it to QF’s executive board of directors for final selection. QF leadership should also develop contingency plans for a two-person, two-position approach to the position of permanent director.

As long as answers to basic questions about QNRF’s (and the QFSSR’s) potential future roles remain pending, RQPI cannot recommend a particular organizational structure among the possible candidates. But simply expanding QNRF’s legacy structure indefinitely will likely prove to be an inadequate way to sustain QNRF well into the future. Therefore, in the interim, QNRF should ensure that any proposed organizational structure is highly flexible and emphasizes positions certain to be needed under nearly any scenario.

By proceeding as described above, QNRF will be well prepared, when the time arrives, to function successfully in the new operating environment implied by its statutory relationship with the QFSSR, as well as with other potential sources of research funding that are external to QNRF itself. This, along with making measurable progress toward building a Qatari research culture, should secure the fund’s sustainability for many years to come.