

Exploring Qatar's Plant Genetic Resources: A Scoping Study

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Project Abstract

Environmental health is defined as the aspects of human health influenced by the physical, chemical, biological, and social aspects of the environment. Environmental health includes the assessment, mitigation, and prevention of environmental factors that can affect health. It also includes the enrichment of environmental factors that can enhance human health (Koren, 2003).

The relationship between human health and ecosystem health is widely recognized by international and national bodies, academics, policy makers, and local and indigenous groups. Despite this, research that integrates human and ecosystem health is limited (LaDou, 2001; UNCED 1992). According to Forget and Lebel (2001), legitimate sustainable development must take into account human well-being and ecosystem integrity. In Qatar, rapid economic growth has resulted in adverse effects on human and ecological health.

This proposed study will explore Qatar's indigenous plant and fungal biodiversity to assess the potential of Qatar's Plant Genetic Resources (PGR) to address two contemporary issues facing Qatar. These issues are: the increase in incidence of 'diseases of affluence' and the desertification of Qatar's arid lands.

This research will assemble the results of the latest studies in disparate fields such as pharmacognosy, epidemiology, microbiology, ethnology, and landscape ecology to yield a document that identifies and evaluates top PGR candidates that could contribute to the improvement of Qatar's public and ecosystem health. In addition, a presentation and extension education booklet will be produced to apprise relevant stakeholders of PGR related opportunities.

Qatar's Environment is typified by agriculturally unproductive soils, extreme aridity, and excessive heat during the summer months. Qatar can be divided into two broad ecosystem types: inland desert with a scarcity of water and nutrients, and coastal zones characterized by periodic tidal events and high salinity (Batanouny, 1981). These two ecosystem types could be further subdivided into at least seventeen different sub-types – that, when combined, support Qatar's 513 species of plants and fungi, most of which have adapted to Qatar's harsh climate over millennia (SCENR, 2004).

Development of the oil and gas industries in Qatar and the subsequent urbanization and industrialization of this country over the past sixty years have had profound influences on public health. This societal shift has resulted in the increased incidence of ‘diseases of affluence’ – which are diseases that result from an increase in wealth. For example, in 2003, 65% of the Qatari male deaths and 70% of the Qatari female deaths were due to cardio-vascular illness, diabetes, malnutrition, neoplasms, and traffic accidents – all diseases of affluence in this context (NHA, 2004).

Why did pre-oil Qatari society enjoy a paucity of these ‘diseases of affluence’? The pre-oil Qatari diet was significantly different from today’s diet. Qatari’s, particularly Bedouin, subsisted on camel milk, meat, dates, and wild plants. Wild plants, with medicinal properties, made significant contributions to health-care prior to the introduction of Western Medicine (Gotting, 2006). Plant medicines still play a role in modern medicine: at least 25% of all modern pharmaceuticals are plant derived, and at least 75% have some plant-derived active ingredients (Hart, 2007). Nutraceuticals, which are chemical compounds with health stimulating effects isolated from natural sources and herbal treatments, are enjoying a popular global resurgence as their efficacy is increasingly validated by scientific study (Wildman, 2006).

Desert ecosystems, such as those in Qatar are among the most fragile on Earth (Bainbridge, 2007). Desertification, or the degradation of arid lands, affects slightly less than 100% of Qatar’s total area (Shakhtra, 1987). The causes of desertification are myriad, and although a scientific study of desertification in Qatar has yet to be completed, several contributing factors are likely: overgrazing, unsustainable utilization of ground and fossil-water reserves, four wheel drive recreation, pollution, and increasing urbanization. Studies on arid lands have shown that, without intervention, it can take up to several hundred years for ecosystems to recover from disturbance (Bainbridge, 2007). Restoration of degraded terrestrial ecosystems is facilitated, in most cases, by the adjunct use of specific plants and fungi that promote the improvement of soil structure and fertility, detoxify polluted environments, and restore the process of ecological succession (Higgs, 2003).

References

Bainbridge, D.A. 2007. *A Guide for Desert and Dryland Restoration: New Hope for Arid Lands*. Island Press, Washington, DC.

Batanouny, K.H. 1981. *Ecology and Flora of Qatar*. Centre for Scientific and Applied Research. University of Qatar, Doha, Qatar.

Cotton, C.M. 1996. *Ethnobotany: Principles and Applications*. Wiley and Sons: West Sussex, UK.

Forget, G., and J. Lebel. 2001. *An Ecosystem Approach to Human Health*. International Journal of Occupational and Environmental Health. 7(2): s1-s38.

Gotting, F. 2006. *Healing Hands of Qatar*. Doha Modern Printing Press, Doha, Qatar.

Hart, N. 2007. *Inviting all the World's Crops to the Table: supporting traditional crops to supply future needs*. Global Facilitation Unit for Underutilized Species. Rome, Italy.

Higgs, E. 2003. *Nature by Design: people, natural process, and ecological restoration*. MIT Press, Cambridge, Massachusetts.

Koren, Herman. 2003. *Handbook of Environmental Health*. Lewis Publishers, London

LaDou, J. 2001. *Preface to An Ecosystem Approach to Human Health*. International Journal of Occupational and Environmental Health. 7(2): s1-s2.

Pasternak, D., and A. Schlissel. 2001. *Combating Desertification with Plants*. Springer Publishing. Warren, Michigan

SCENR: State of Qatar. 2004. *National Biodiversity Strategy and Action Plan*. SCENR, Doha Qatar.

Shakhatra, M. 1987. *Desertification in the Arab World: Causes and Consequences. Combating of Desertification in North African Countries*. The Green Belt for North African Countries, Arab League Educational, Cultural, and Scientific Organization, Tunisia.

State of Qatar - National Health Authority. 2004. *Annual Health Report 2004*. Vital and Health Statistics. Preventative Health Directorate of the NHA.

UNCED. *The Global Partnership for Environment and Development*. A Guide to Agenda 21, 1992.

Wildman, R. 2006. *Handbook of Nutraceuticals and Functional Foods*. CRC Press, Boca Raton, Florida.