# QUR'ANIC BOTANIC GARDENS NETWORK

**AND**

# MASTER PLAN FOR QUR'ANIC BOTANIC GARDEN IN SHARJAH, UNITED ARAB EMIRATES

# PROJECT EVALUATION

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BGCI
Plants for the Planet

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## Contents

**شبكة حدائق النباتات القرآنية**
**والمخطط الرئيسي لحديقة النباتات القرآنية**
**الشارقة – الإمارات العربية المتحدة**

**تقييم المشروع**

**الخلاصة:**

يعرض التقرير المبين تقييم لمشروع شبكة الحدائق النباتية القرآنية المقترحة والمبين في وثيقة مكتب اليونسكو بالدوحة (مقترح مشروع لعام 2006). تأسيس حدائق نباتية جديدة مصممة لتدخل فيها عناصر صحراوية وقرآنية ، تعتبر من إحدى المراحل الأساسية في عملية تطوير هذه الشبكة.

هذا التقرير يراجع أيضا المخطط الرئيسي للحديقة النباتية القرآنية الجديدة بإمارة الشارقة – الإمارات العربية المتحدة. حيث تعتبر هذه الحديقة العنصر الأول في الشبكة المقترحة. تقيم الأقتراح لهذه الشبكة والحديقة في الشارقة مبني على دراسة وثائق المشروع وزيارة للموقع والمقابلات الشبه منظمة ودراسة الخبراء.

ويعتبر تطوير الحديقة التجريبية في الشارقة خطوة نحو الإنجاز الكامل لشبكة الحدائق النباتية القرآنية وهو مرغوب فيه جدا من المنظور الثقافي والإيكولوجي ومرحب به ترحيبا واسعا في المنطقة. تطوير الحديقة في الشارقة بتعدد أدوارها الوظيفية هي خطوة طموحة من الممكن إعتبارها حاسمة في النجاح المرجح لهذه الشبكة. حيث يجب أن يكون تصميم وتطوير المواقع متكاملا مع التخطيط التعليمي والأبحاث وأهداف الحفظ من البداية ويتعين النظر بعناية للكوادر البشرية القادرة والمؤهلة على التعامل مع جميع المجالات.

فكرة شبكة الحدائق النباتية القرآنية يمكن أن تتم بشكل فعال جدا, بالتوازى مع الحديقة الجديدة, في حال إن العمل الجاري في المنطقة لدعم ودمج الحدائق النباتية القائمة تم أخذه بعين الأعتبار.

يعتبر مشروع شبكة الحدائق النباتية القرآنية معقدا وشاملا وهو فعليا مخطط للحفاظ على الموارد النباتية في المنطقة بطريقة مناسبة إجتماعيا. وهذا سيساعد على التطبيق و البناء على الإستراتيجية العالمية لحفظ النباتات (GSPC) مفسر بالسياق العربية. والمطلوب ممارسات عمل قادرة على دمج مناهج فكرية مختلفة.

ونوصي بأن تكون الى أقصى حد ممكن عمليات التخطيط , لكل من الحديقة التجريبية والشبكة ، واسعة النطاق ومصممة بطريقة حيث تكون عملية التخطيط بحد ذاتها تعليمية.

سيكون من المهم ضمان أن الخبرة الإقليمية منسقة بشكل فعال و يكون هناك آليات لتطوير بروتوكولات ومعايير مشتركة . ويقدم هذا التقرير سلسلة من التوصيات كنتيجة التقييم.

## Executive Summary

This report presents an evaluation of the proposed Qur'anic Botanic Gardens Network as set out in the UNESCO Doha project document (Project Proposal, 2006). One of the key stages in the eventual development of the Network is the establishment of new botanic gardens designed to incorporate 'Desert' and 'Qur'anic' Garden elements. The evaluation also reviews the Master Plan for the new Qur'anic Botanic Garden in Sharjah, United Arab Emirates (UAE) – the first component in the proposed Network. The evaluation of the Network proposal and the garden in Sharjah are based on review of project documents, a site visit, semi-structured interviews and an expert survey.

The development of the pilot garden in Sharjah as a step towards the overall achievement of the Qur'anic Botanic Gardens Network is highly desirable from cultural and ecological perspectives and is broadly welcomed within the region. Developing the garden in Sharjah with its multi-functional roles is an ambitious undertaking that can be considered crucial to the likely success of the Network as a whole. Site design and development need to be integrated with the planning of education, research and conservation objectives from the outset and human capacity to deliver on all aspects needs to be considered carefully.

The development of the Qur'anic Botanic Gardens Network conceptually can proceed very effectively in parallel with new garden development if ongoing work within the region to support and integrate existing botanic gardens is taken into account. The overall Qur'anic Botanic Gardens Network project is complex and is effectively a blueprint for the conservation of plant resources throughout the region in a culturally appropriate way. As such this will help to implement and build on the Global Strategy for Plant Conservation (GSPC) interpreted in an Arabic context. Working practices that blend different intellectual approaches will be required. To the extent practicable, it is recommended that planning processes both for the pilot garden and the network are widely inclusive, designed so that the planning is in itself a learning process.

It will be important to ensure that regional expertise is effectively coordinated and that there are mechanisms for developing common protocols and standards. A series of recommendations is presented in this report as an outcome of the evaluation process.

## Acknowledgements

BGCI would like to thank all the people who freely gave their time and expertise to contribute to this evaluation. The questionnaire responders and interviewees are listed in ANNEX 4). The evaluation team is also grateful to the staff at the UNESCO Office in Doha who facilitated the evaluation process through the provision of information and related documentation, and organised BGCI's evaluation mission to Doha (Qatar), as well as to Sharjah and Dubai (United Arab Emirates). A special thank you goes to Nadine Loufti for the translation of the executive summary into Arabic.

# 1 Introduction

## 1.1 The Qur'anic Botanic Gardens Network

The United Nations Educational, Scientific and Cultural Organization (UNESCO) deploys its actions in the fields of Education, Natural Sciences, Social and Human Sciences, Culture, Communication and Information. Its Natural Sciences sector works in an interdisciplinary context and implements major international environmental programmes. In 2006, UNESCO developed a Main Line of Action 'Enhancing linkages between cultural heritage and biological diversity conservation' which was approved by UNESCO's Member States.

Pursuing this Main Line of Action, UNESCO Doha launched the Qur'anic Botanic Gardens Project in 2006 – henceforth referred to as the 'Project'. In view of the limited botanical expertise and facilities, as well as loss of natural habitats and associated native fauna and flora, the Project aims 'To establish a network of botanic gardens in the Arab region influenced by scientific and aesthetic concepts from the Islamic garden cultures and from the Holy Qur'an' (Qur'anic Botanic Gardens Project – Project Proposal, 2006). In this spirit, the Project combines these cultural elements with a call for *ex situ* conservation of the native flora of the Arabian Peninsula (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Yemen) and the plants referenced in the Holy Books of Islam, namely the Holy Qur'an and the Sayings of the Prophet Mohammed (Al Hadith). In terms of garden design, the Project seeks to reflect two major concepts of Islamic gardening philosophies, one based on desert environments including wadis, baadiyas, and raudhas, and one characterized by planned gardens, such as Persian concepts of sunken beds, chahar bagh, gulistan and bustan.

The Project suggests establishing a network of botanic gardens in the region as 'centres of excellence for botanic education, research and conservation' (Qur'anic Botanic Gardens

Network – Terms of Reference for Evaluation, 2008). This network endeavours to make a major contribution to capacity building and biodiversity conservation, 'especially because of the lack of true botanic gardens in the entire Arab region' (Qur'anic Botanic Gardens Network – Terms of Reference for Evaluation, 2008).

To initiate the implementation of the Project, UNESCO Doha commissioned the development of two Master Plans, one in Sharjah (United Arab Emirates) in 2007 and one in Doha (Qatar) in 2008. These Master Plans are based on guidelines that have been elaborated by a team of international experts (Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan; and Guidelines for the Qur'anic Botanic Garden in Qatar).

## 1.2 Purpose of the Evaluation

In line with UNESCO's evaluation policy, Botanic Gardens Conservation International (BGCI) was selected following a tender competition to undertake a formative and summative evaluation of the Project. The assessment aims to examine progress and achievements of the Project to date to inform decisions on its future implementation. The main objectives are to assess the relevance, effectiveness, efficiency, utility and sustainability of the Project. This will include assessment of the Project deliverables and processes and their requirements for transferability to other sites in the region. The specific objectives set down in the Terms of Reference for Evaluation are made available in ANNEX 1.

As mentioned in section 1.1, two Master Plans have been developed as pilots of the Qur'anic Botanic Gardens Network. This evaluation report includes an assessment of the Master Plan for Sharjah. The evaluation of the Master Plan for Qatar is provided as a separate report.

## 1.3 Background on the Evaluator: Botanic Gardens Conservation International

Botanic Gardens Conservation International (BGCI) is the world's largest network of botanic gardens and affiliated institutions, bringing together the expertise of over 600 botanic garden members. Within North Africa and the Middle East, BGCI has 34 member gardens. The mission of BGCI is *to mobilize botanic gardens and engage partners in securing plant diversity for the benefit of people and the planet*.

At a global level, BGCI has been closely involved in the development and implementation of the Global Strategy for Plant Conservation (GSPC) under the auspices of the Convention on Biological Diversity and is the lead facilitating agency for two targets of the GSPC; Target 8 relating to *ex situ* conservation and Target 14 relating to education and public awareness (see ANNEX 2 for a list of GSPC Targets).

BGCI is involved in developing and supporting regional botanic garden networks. As part of its Investing in Nature Programme (2002-2007) funded by HSBC, BGCI specifically set out to establish an Arab Botanic Gardens Network in the Middle East and convened two regional meetings to facilitate this process. BGCI has also been directly involved in the planning, design and establishment of new botanic gardens in countries such as Jordan, Oman and Saudi Arabia. Key documents produced by BGCI to guide technical development and conservation planning by botanic gardens include the *Darwin Technical Manual for Botanic Gardens* and the *International Agenda for Botanic Gardens in Conservation*, both of which are available in Arabic.

# 2 Methodology

## 2.1 Introduction

To evaluate the Qur'anic Botanic Gardens Network, BGCI, capitalising on its international experience and worldwide network of botanic garden members and affiliated institutions, drew up a methodological framework and questionnaire survey. This involved analysing the specific objectives of the project and identifying the key questions that needed to be asked in order to determine how successfully the objectives had been met. The relevant data sources were also identified, as were the methods of data collection.

## 2.2 Approach to Data Collection

The data collection involved a triangulation process which included - Document Reviews, Semi-Structured Interviews and Surveys.

Document Reviews – A large range of documents, publications and letters were consulted and reviewed during the evaluation process. These included:

- *Qur'anic Botanic Gardens Project – Project Proposal to Establish a Network of Botanic Gardens in the Arab Region Influenced by Scientific and Aesthetic Concepts from the Islamic Garden Cultures and from the Holy Qur'an*
- *Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Qur'anic Botanic Garden in Sharjah*
- *Master Plan Manual – Qur'anic Botanic Garden in Sharjah*

- Other relevant documents provided by the UNESCO Office in Doha, including documents recording the development process of the project (e.g. copies of emails and letters) as well as background documents (Request for Proposal documents and reviews of the Master Plan Manual) and contracts between UNESCO and third parties.

Semi-Structured Interviews – During a mission to Doha, Sharjah and Dubai in July 2008, face-to-face semi-structured interviews were conducted with project stakeholders. These included staff at UNESCO Doha Office, the landscape architects for the project, members of the International Advisory Committee and staff of relevant institutions. Three additional stakeholders were interviewed in the United Kingdom.

Surveys – Following the evaluation mission, a questionnaire survey was prepared and sent to all the members of the International Advisory Committee represented on both committees – the Sharjah project (comprising 26 experts) and the Qatar project (comprising 12 experts). The survey was also sent to 16 relevant experts known to BGCI, who are likely to have an interest in the aims of this initiative. Three additional experts were interviewed in the United Kingdom. The surveys included a mixture of open and closed questions. Responses were collated to enable conclusions and trends to be drawn.

The questionnaire survey form is given in ANNEX 3 and the experts who participated in the consultation process and provided their views and comments are named in ANNEX 4.

# 3 Evaluation of the Qur'anic Botanic Gardens Network

## 3.1 Introduction

As highlighted in section 1.2, this evaluation offers an analysis and recommendations for the future implementation of the Qur'anic Botanic Gardens Network. It reflects BGCI's own assessment in conjunction with the results from the stakeholder consultation mentioned in section 2. This part of the report aims to provide an assessment of the relevance, effectiveness, efficiency, utility and sustainability of the Qur'anic Botanic Gardens Network with recommendations for future implementation.

## 3.2 Evaluation

### 3.2.1 Relevance

A stated aim of the Project is to pursue 'important objectives in the fields of: environmental conservation; scientific; culture; and education and recreation'

(Qur'anic Botanic Gardens Project – Project Proposal, 2006, p 14). This is further expanded upon to read 'establishing a network of botanic gardens in the region, including centres of excellence for botanic education, research, and conservation (Qur'anic Botanic Gardens Network – Terms of Reference for Evaluation, 2008). As originally conceived, function and design of each new botanic garden would be integrated to include, i) a 'Qur'anic Garden', as a means mainly to reflect the public awareness and education objective; ii) a 'Desert Garden', to encompass the conservation component of the garden by establishing *ex situ* collections of plants from the region; and iii) research facilities whose architecture would reflect Islamic/Persian aesthetic and functional principles; the latter would also be applied in the design of the 'Qur'anic' and 'Desert Garden'.

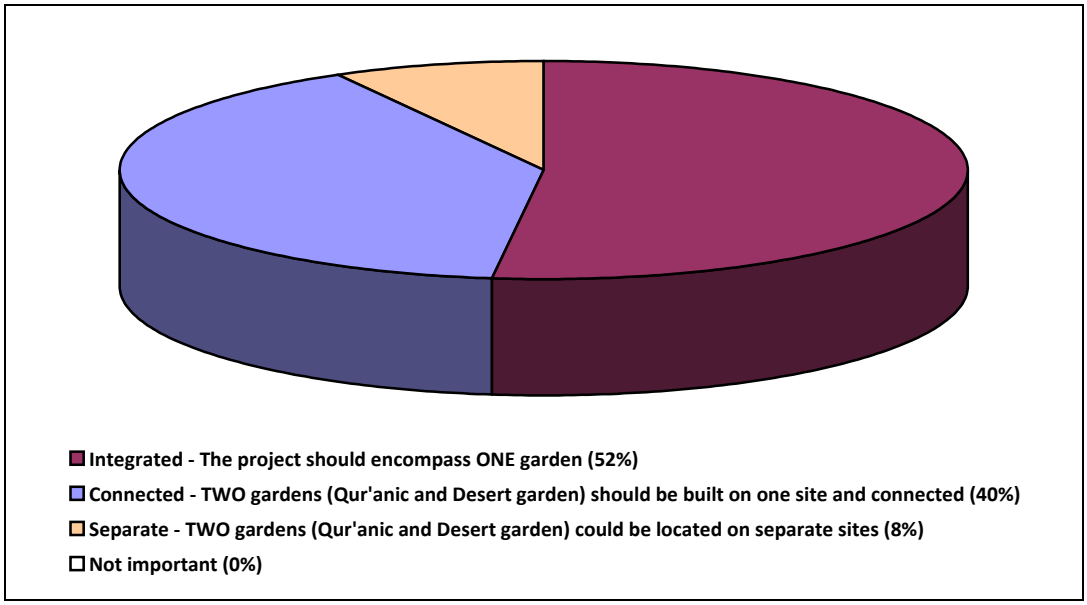
While it is a highly commendable approach to integrate conservation, science and education and the cultural and religious foundations of the region, a major challenge remains in operationalising the integration of function and design:

There is a long history in the region of developing gardens using Persian garden design concepts. However, it was pointed out during the stakeholder consultation to undertake the evaluation that there are no established historical fundamentals, records and models for designing 'Qur'anic' gardens. Including 'science' into the garden's remit and calling it a 'Qur'anic Botanic Garden' which is used by the Project to encompass also the above-mentioned 'Desert Garden', could be a source of a major confusion as far as the role of such a garden is concerned. Articulating clearly the connectivity issues in terms of function and design between the two garden components will be critical. For example, how the botanical display of plants referenced in the Holy Qur'an is related to Islamic medical traditions, and how these are reflected combining traditional garden design concepts and specific ecological requirements of individual species, needs to be carefully considered. Given the potential 'oasis' nature of the 'Qur'anic Garden' in a desert environment, a strong link between the two gardens would seem to be highly desirable.

In terms of function and design, the stakeholder consultation clearly highlights (52% of all the stakeholder responses) the importance of the garden designed as a functional entity to include the 'Qur'anic' and the 'Desert Garden' (see Fig 1). A large number of stakeholders (40%) also drew attention to the need of ensuring functional connectivity should the two gardens be built as individual entities, while only a few experts (8%) were of the opinion that the gardens could be located in separate sites. None of the stakeholders consulted thought that this question was

of no importance. The discussion on garden function and design and its implications for the associated facilities is of particular relevance to the Master Plan for Sharjah as explained and assessed in section 4 of this report.

**Fig 1: Stakeholder views on the relationship between the Qur'anic Garden and the Desert Garden in the Qur'anic Botanic Gardens Network model**




To maintain the highly relevant overall vision of the Project, a further challenge remains in communicating the Project concept as unambiguously as possible while retaining high levels of creativity in the implementation. This will be particularly vital, ultimately, if and when the Project is applied to regions beyond the Arabian Peninsula, the Middle East, North Africa and West Asia to include for instance Indonesia and other countries in Southeast Asia where different environmental conditions though strong cultural links prevail.

The broader relevance of the Project can be seen as contributing to international obligations for biodiversity conservation for example through the Convention on Biological Diversity (CBD) to which countries throughout the region are Parties. A particular focus of the CBD is the Global Strategy for Plant Conservation (GSPC) with its 16 targets to be met by 2010 (see ANNEX 2). The Plant Conservation Strategy for the Arab World being developed by the IUCN/SSC Arabian Plant Specialist Group which reflects the GSPC targets also gives relevance to the project.

*Recommendation:*

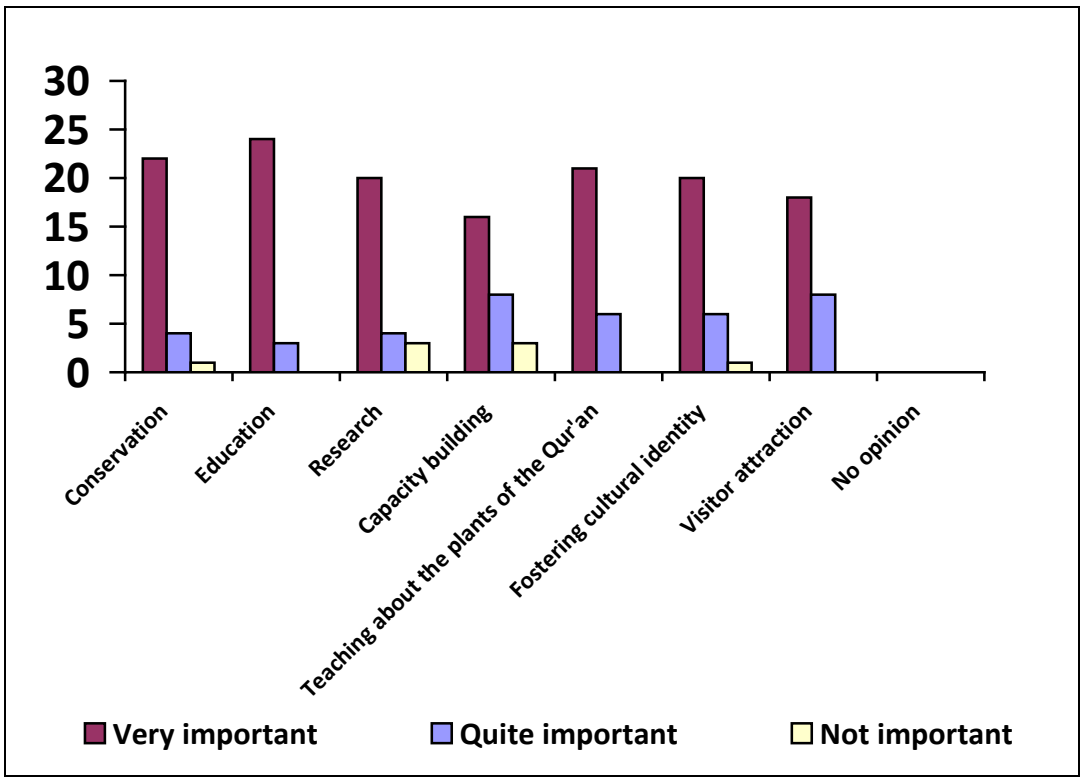
- *To ensure the successful integration of function and design of new gardens in the region to form part of the Qur'anic Botanic Gardens Network it will be important to fully capitalize on the lessons learnt in conceptualizing and implementing the initial pilot garden projects. A short but concise rationale of the functional relationship between the 'Qur'anic Garden' and the 'Desert Garden' will inform the planning process for new gardens and will help to promote the Qur'anic Botanic Gardens Network to other regions of the world while ensuring cohesive identity.*

### 3.2.2 Effectiveness

The ambitious endeavour of the Qur'anic Botanic Gardens Project has indeed been motivated by the continuing loss of plant diversity which is apparent globally and locally, and by the lack of botanical institutions which can address this conservation crisis at the regional level. Around the world botanic gardens have become important agencies for plant conservation particularly over the past 30 years. An overview of existing botanic gardens in the Arabian Peninsula, the Middle East, West Asia and North Africa indicates the limited number of botanic gardens within this broad region. This is shown in ANNEX 5 based on information provided by GardenSearch, the global database of botanic gardens maintained by BGCI. While some countries have one or few botanic gardens and/or affiliated institutions with potential to tackle plant conservation challenges (e.g. Saudi Arabia, Egypt), there are other countries with no entry of any botanic garden in GardenSearch (e.g. Yemen, Bahrain).

It therefore does not come as a surprise that the stakeholder consultation unanimously confirms the importance of the Project to develop a network of functional botanic gardens in the region. Developing the capacity for environmental education, plant conservation and research, through botanic gardens at regional and national scales was considered to be particularly important (see Fig 2). Focusing to a large extent on species occurring in arid ecosystems as a predominant feature of the region, the potential contribution of the Project to conservation outcomes at global level is equally apparent.

**Fig 2: Stakeholder views rating the importance of the Qur'anic Botanic Gardens Project**




The stakeholder consultation also highlights the opportunities of the Project for environmental education and public awareness of the importance of the Holy Books of Islam in promoting the need for conservation using examples of plants cited in the Holy Qur'an and the Hadith.

As mentioned above, at present the number of botanic gardens that are effectively operating in the region is very small. This is partly because of inadequately allocated resources for botanic gardens in addition to the lack of experts in the region with the required experience to develop and manage botanic gardens.

From BGCI's recent experience supporting botanic garden development in Jordan and Oman there is still a need for major input from outside of the region – particularly when the ambition to develop a 'centre of excellence' is being pursued. Therefore, when looking at the development and on-going management of the proposed botanic gardens it is extremely important to investigate and decide very early on in the planning process how the institution will actually be

staffed. In the example of the Oman Botanic Gardens, there has been a definite policy to develop the garden so that it will be staffed ultimately with Omani nationals – both in terms of management and horticultural work. While it may be necessary to partly staff it with expatriates for some time, and even this is not guaranteed, the desire to have in-country staffing has been seen as very important.

Given the lack of expertise immediately available for even a small number of gardens, there is an obvious need for a very serious effort to build capacity within the region. This needs to be given thorough thought before the botanic garden commences development. In numerous countries BGCI has considerably helped build the capacity of botanic gardens and is prepared to further assist in the design and establishment of specific training modules. This would involve both the organisation of courses and targeted workshops and the possible organisation of staff exchanges with other institutions.

The idea of creating a single botanic garden as an institution regarded internationally as a 'centre of excellence' is without a doubt a big challenge. Aiming at establishing a number of new botanic gardens in the Arab region and setting up 'centres of excellence for botanic education, scientific research and conservation' poses an even greater challenge. BGCI has been supporting the establishment of the Arab Botanic Gardens Network for several years (see section 1.3). The Project plays a valuable role in the development of botanic gardens in the region. The potential of the network in terms of encouraging existing gardens and those in development to work together, however needs to be further explored.

*Recommendations:*

- *It is important to first create an operating example of a 'centre of excellence' to be a model botanic garden that can function both independently and collaboratively.*
- *A continued involvement with the Arab Botanic Gardens Network should be considered. Funding for a small secretariat (one staff person) would greatly facilitate this process.*
- *Interaction with relevant organisations/institutions already operating or in the process of being developed should be further enhanced, including links with universities and conservation organizations. Specifically, contacts*

*should be maintained and strengthened with the IUCN/SSC Arabian Plant Specialist Group which has 87 members from 11 countries.*

- *The establishment of a capacity building action programme addressing all dimensions of botanic garden development requires to be addressed as the linchpin of any new garden conceived under the Qur'anic Botanic Gardens Network.*

### 3.2.3 Efficiency

As discussed earlier in section 3.2.2, the Project's development process to date suggests that further scope remains to fully capitalise on the recent experience gained by other garden developments e.g. in Jordan, Oman, Egypt and Saudi Arabia. While UNESCO took advantage of the second conference organised by BGCI of the Arab Botanic Gardens Network – hosted by the Royal Botanic Garden of Jordan under the leadership of Her Royal Highness Princess Basma Bint Ali of Jordan, in March 2007 – to present the Qur'anic Botanic Gardens Project, regular information exchange and communication between the project planners and the members of the Arabian botanic gardens network will be vital to further promote the Project in the region.

At global level, UNESCO has sought to build on the expertise and experience of relevant gardens such as the Desert Botanical Garden, Phoenix (USA), however the potential to capitalise on the work of other major gardens of great importance in terms of their *ex situ* conservation policies and collections of plants from arid environments such as Alice Springs Desert Park (Australia), Arizona-Sonora Desert Museum (USA) and Karoo Desert National Botanic Garden (South Africa) should be further explored. Operating in similar extreme environmental conditions, these botanic gardens provide a tremendous opportunity to build on experience and lessons learnt in an effort to use resources efficiently and cost effectively. Capitalising on, as much as possible, previous and current experience is a vital necessity to achieve this.

In order to assess the fiscal probity in terms of efficient use of resources, a proper financial audit would have been required which goes beyond the scope of this evaluation. However, it is pointed out here that the change in the scope of the responsibility of UNESCO for the development of the Master Plan of Sharjah – redefined and confined to the establishment of the 'Qur'anic Garden' element after the Funds-in-Trust Agreement had been signed between the Government of

Sharjah and UNESCO (see section 4.1) – gives rise to the question of how and/or if resources were reallocated to reflect the change in accountability.

*Recommendation:*

- *Take further advantage of related experience gained and lessons learnt in the region and internationally to contribute to maximised efficiency and cost-effectiveness in the use of resources.*

### 3.2.4 Utility

The Qur'anic Botanic Gardens Project has no doubt generated lively attention in the region. Following the meeting of the Arab Botanic Gardens Network (see section 3.2.3), UNESCO communicated interest from participants of the meeting from Morocco, Palestine, Jordan and Lebanon in establishing related gardens in their countries (Qur'anic Botanic Gardens Network – Terms of Reference for Evaluation, 2008).

The 16 experts not represented on either of the two International Advisory Committees who were additionally consulted for this evaluation (see section 2.2) showed that with exception of one expert, all stakeholders were aware of the Project. One expert pointed out the potential interest in the Project of major Islamic institutions, e.g. the Asqar University in Cairo, Egypt. Similar interest has been indicated by Iran gathered from recent correspondence with UNESCO. While stakeholders did not specify information needs of particular concern, lack of overall communication and flow of information on the Project following the meeting of the proposed network of Arabian botanic gardens in Amman, Jordan in 2007, was pointed out repeatedly.

*Recommendation:*

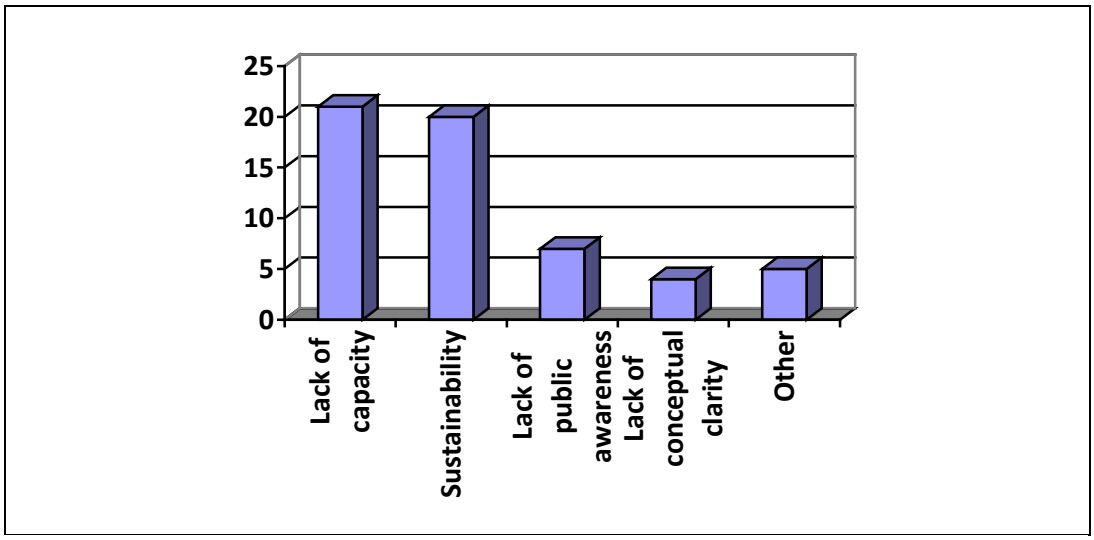
- *Following a proposed wide publication of the evaluation results of the Qur'anic Botanic Gardens Project, UNESCO may like to consider organising an international seminar with relevant stakeholders to debate the linkages between biodiversity conservation, botanic gardens and Islam, which will offer an opportunity to showcase progress and challenges in implementing the Project.*

### 3.2.5 Sustainability

As with most botanic gardens today, the gardens conceived under the Project face a tremendous challenge to generate sufficient resources and income to sustain

their work. Lack of capacity to manage the gardens, as well as overall issues of sustainability, in particular financial viability were raised as major potential threats during the stakeholder consultation (see Fig 3).

**Fig 3: Challenges and Threats to the Qur'anic Botanic Gardens Project**




Therefore, a lasting source of funding must to be identified and guaranteed to sustain education, research and conservation work, even though some of the gardens may have an opportunity to raise to some degree income through sources such as ticketing, events and concessions. How much these latter activities are going to be regarded as important parts of the gardens' operation will need to be further determined. Overall, it should be noted however, that the gardens envisaged under the Qur'anic Botanic Gardens Project offer an enormous potential to become sites of cultural importance and thereby could significantly facilitate resource mobilisation.

As far as possible structures that will help to make the botanic gardens sustainable are concerned, the following possible options should be considered:

i) Part of a government department (e.g. related to Conservation or Education): While this provides an easier connection with the government as a funding body it also can cause serious delays in the running of the garden as a business. This is of particular significance if the materials needed to operate the botanic garden are not locally or regionally available. However, many government funded botanic gardens in the

world operate this way, using minor contractual arrangements for work such as cleaning and catering.

ii) An independent but government supported institution, with a Board answering to the government: This provides a greater degree of independence but can still be strongly influenced by government procedures and opinions. This organizational arrangement is used widely and has the advantage of involving representatives from different parts of the community.

iii) Part of a university: The benefits include the university being able to: use the botanic garden as a teaching and research resource; provide a source of staff, and; give the botanic garden further academic, scientific, and cultural credibility. This could be of particular significance given the limited amount of expertise otherwise available. One major weakness could be the amount of support the botanic garden would receive within the university/department at any one time. It is also still necessary to consider how the commercial aspects of the botanic garden will be addressed. However, there are again many examples of botanic gardens structured in this way.

iv) An independent company/institution/charity fully responsible for its own management and income but still receiving some government support: This provides far greater freedom for the institution but puts activities such as research, conservation and education at greater risk as their importance can depend on total funds available. A variation that could be considered is that the activities of the botanic garden are split into two areas. One section is responsible for the Horticulture, Science and Education and one that is responsible for the commercial aspects and (non horticultural) maintenance. This would recognise the importance of horticulture, research and education while still encouraging the gardens commercial development. It is assumed that such an arrangement would still have to have a 'Director General' over-seeing the entire institution.

*Recommendation:*

- *Consider how the newly conceived botanic gardens will relate to government and other institutions taking into account both those aspects of the botanic garden that will always require financial support and those*

*capable of producing funding for the garden or running contracted businesses.*

### 3.3 Overview of Recommendations for the Qur'anic Botanic Gardens Network

Relevance:

- *To ensure the successful integration of function and design of new gardens in the region to form part of the Qur'anic Botanic Gardens Network it will be important to fully capitalize on the lessons learnt in conceptualizing and implementing the initial pilot garden projects. A short but concise rationale of the functional relationship between the 'Qur'anic Garden' and the 'Desert Garden' will inform the planning process for new gardens and will help to promote the Qur'anic Botanic Gardens Network to other regions of the world while ensuring cohesive identity.*

Effectiveness:

- *It is important to first create an operating example of a 'centre of excellence' to be a model botanic garden that can function both independently and collaboratively.*
- *A continued involvement with the Arab Botanic Gardens Network should be considered. Funding for a small secretariat (one staff person) would greatly facilitate this process.*
- *Interaction with relevant organisations/institutions already operating or in the process of being developed should be further enhanced, including links with universities and conservation organizations. Specifically, contacts should be maintained and strengthened with the IUCN/SSC Arabian Plant Specialist Group which has 87 members from 11 countries.*
- *The establishment of a capacity building action programme addressing all dimensions of botanic garden development requires to be addressed as the linchpin of any new garden conceived under the Qur'anic Botanic Gardens Network.*

Efficiency:

- *Take further advantage of related experience gained and lessons learnt in the region and internationally to contribute to maximised efficiency and cost-effectiveness in the use of resources.*

Utility:

- *Following a proposed wide publication of the evaluation results of the Qur'anic Botanic Gardens Project, UNESCO may like to consider organising an international seminar with relevant stakeholders to debate the linkages between biodiversity conservation, botanic gardens and Islam, which will offer an opportunity to showcase progress and challenges in implementing the Project.*

Sustainability:

- *Consider how the newly conceived botanic gardens will relate to government and other institutions taking into account both those aspects of the botanic garden that will always require financial support and those capable of producing funding for the garden or running contracted businesses.*

# 4 Evaluation of the Master Plan for the Qur'anic Botanic Garden in Sharjah

## 4.1 Introduction

Following UNESCO's presentation of the Qur'anic Botanic Gardens Project to the Government of Sharjah in early June 2006, the Ruler of Sharjah, His Highness Dr Sheikh Sultan Bin Mohammed Al Qassimi, agreed to fund the development of a Master Plan consisting of two sections, one, a 'Qur'anic Garden' based on the Islamic garden cultures and displaying the plants mentioned in the Holy Qur'an and in the Sayings of Prophet Mohammed; and one 'Desert Garden' section, exhibiting desert plants of the Arabian Peninsula (UNESCO mission report, United Arab Emirates, June 6-8, 2006). To this aim, the Ruler made available two plots of land each 1sq km in size – one plot for the 'Qur'anic Garden' and the other for the 'Desert Garden'. In this spirit, an agreement was signed mid November 2006 between the Government of Sharjah and UNESCO to design this Master Plan at a scale of 1:500 – referring to the establishment of a 'Qur'anic Botanic Garden' in Sharjah for which the Government granted UNESCO funds or contributions in kind. The Office of the Ruler of Sharjah confirmed in early June 2007 that His Highness Dr Sheikh Sultan Bin Mohammed Al Qassimi had decided to confine UNESCO's responsibility exclusively to the development of the 'Qur'anic Garden' element, while directly appointing another contractor to develop the 'Desert Garden' element.

As part of the initial work phase ('planning programme') to develop the Master Plan for the Sharjah Qur'anic Botanic Garden, UNESCO established an International Advisory

Committee (IAC) to elaborate a guidelines document advising the contracted party on the establishment of the second and third phases - the architectural plan development ('preliminary architectural plan 1:2000'; 'definite architectural plan 1:500'). The meeting of the IAC was held from 1-6 May 2007 and the ensuing document – Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan – published in June 2007, set out the need for a Qur'anic Botanic Garden, presented the mission, vision and objectives of the project and outlined the timeframe, economic resources and technical specifications required to establish the 'Qur'anic Garden' as well as the 'Desert Garden' sections.

The UNESCO Tender Evaluation Committee decided in late June 2007 on the successful bidder for 'Master Plan for Establishing a Botanical Garden' in Sharjah following an Open International Competition (see section 4.2.1). The contracted company, GARY BARTSCH INTERNATIONAL (see below), delivered the Master Plan in December 2007, after comments of UNESCO and three external experts were made available to the company, and partly integrated into the document. UNESCO handed in the final Master Plan to the Ruler's Office in Sharjah, to His Highness Dr Sheikh Sultan Bin Mohammed Al Qassimi. The project was then transferred to His Excellency Sheikh Khaled Bin Saqr Al Qassimi, Director General of the Directorate of Public Works in March 2008. Letters were exchanged, and meetings were arranged during 2008 to discuss UNESCO's further collaboration with the Government of Sharjah and the potential involvement of BGCI in support of the Qur'anic Botanic Garden during the construction phase, and beyond. In recent correspondence with UNESCO we have been informed that seed collection has already commenced.

## 4.2 Findings

### 4.2.1 Sharjah Master Plan Development Process

***Guidelines for Developing the Master Plan***

In considering the overall aim of the Qur'anic Botanic Gardens Project, the Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan state that 'A Qur'anic Botanic Garden should demonstrate the basic principles of Islam and provide an 'oasis in the desert' for peaceful reflection and tranquil contemplation in an aesthetically pleasing and sustainable environment' (p 13). The Guidelines also reiterate that the garden should play a role in conservation, research and education, articulated as 'visions' in the document.

The Guidelines make a commendable effort to engage with the material and logistical requirements of delivering on these visions, although we would have expected to see a firmer evidence base for them. We would argue therefore that a

further and more detailed account of these 'visions' would be helpful, as explained below. The visions could draw on or be specifically related to international and regional agreements such as the Convention on Biological Diversity.

The *Conservation Vision* states to 'focus initially on *ex situ* conservation through seed storage and field gene banks' (p 14). While details are given on requirements for seed storage and living plant material to be maintained in the field gene bank, and the importance and role of representing the species' genetic diversity is highlighted, no guidance is provided on how this is to be achieved in the establishment of *ex situ* collections. Given the tremendous differences in plant species diversity between the countries of the Arabian Peninsula, North Africa and West Asia (see ANNEX 6) ranging from a few hundred (e.g. Qatar) to several thousand (e.g. Saudi Arabia), the establishment of genetically representative collections of the native flora will be a challenging task at least for some countries, let alone the establishment of *ex situ* collections representing the regional diversity in species and genetic variability within species. Collaboration will be essential based on a gap analysis of existing *ex situ* collections for example those maintained by the agricultural sector and the Millennium Seed Bank (MSB) Project which has a particular focus on arid land plants. In terms of *ex situ* conservation through seed storage, the expertise of and coordination with the MSB Project (United Kingdom) should be sought.

The *Research Vision*, highlighting the herbarium as a core element of a botanical research institution, aims to compile around 100,000 specimen sheets. It will be important to identify priority species for herbarium collections and to develop a time frame within which this work will be accomplished. The Guidelines provide information about the physical requirements for the proposed herbarium and various laboratories. This needs to be accompanied by a vision for the work that will be carried out within the laboratories and a proposed prioritisation of work to determine exactly what facilities are needed and by when. Details are also provided about the size and numbers of rooms, number of volumes of books, equipment, etc. It would be useful to know what these specifications are based on as it is not clear that these recommendations are evidence-based.

The *Education Vision* appears to focus on providing information on plants and environmental sustainability. However, if the garden is to encourage sustainability, which implies behaviour change as well as awareness raising, then we would argue that the garden's education vision adopts a broader framework. We would recommend a re-evaluation of the guidelines in line with BGCI's own guidelines on

Environmental Education and Education for Sustainability. While indeed BGCI's guidelines are referred to in the document, it is unclear whether and to what extent they have been adopted. The Education Vision, in its present guise, does not clarify its plans for teaching about plants and the Qur'an. In our view, this is an important aspect of the garden's function. We would recommend that this aspect be given careful consideration, especially since the Guidelines state that 'the Qur'anic section should have a sacred character that induces peace, reverence and meditation' (p 30).

We commend the *Environmental Sustainability Vision*, which states that the garden should become a model for sustainability. We would support moves to make this one of the driving forces behind the design for the garden.

In conclusion, while we believe that the Guidelines overall provide important and pertinent fundamentals to develop the Master Plan, it nonetheless can also be argued, that the various sections differ tremendously as far as the structure and level of detail is concerned which gives the document a somewhat heterogeneous appearance. For future Guidelines' development it is therefore suggested to present the information in a more structured way, e.g. using the following sections: a) Strategic Plan; b) Facilities Plan; and c) Operating Plan.

*Recommendation:*

- *Future guidance to establish the master plan of a proposed garden should be made available in a cohesive structure using e.g. the sequence of a Strategic Plan; Facilities Plan; and Operating Plan.*

***Open International Competition***

An Open International Competition (OIC) was held between 15 April and 10 May 2007 by UNESCO to select a company to develop a 'Master Plan for Establishing a Botanical Garden'. The competition was advertised through the print media and UNESCO's own network. It should be noted that the procurement notice of the OIC does not mention the notion of 'Qur'anic Botanic Garden', but states that the Master Plan aims at 'establishing a botanical garden based on the regional garden cultures of the Gulf, in order to preserve the regional flora of the Arabian Peninsula ex situ'.

Companies who expressed an interest in submitting a bid were sent Request for Proposal (RfP) documents that laid out the requirements for the bid. Prospective bidders were informed of a meeting scheduled to take place on 1-6 May 2007 and

were invited to attend the meeting at their own cost as 'Interested companies may have a better idea of the master plan taking part in the meeting…'.

We note that advertisements for the tender were posted on or about April 18 2007, less than two weeks before the proposed meeting. It could be argued that some prospective bidders may have been placed at a disadvantage by this relatively tight timetable. The meeting referred to was the International Advisory Committee meeting, during which the Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan were formulated and subsequently published (see above). The compressed timetable and the lack of opportunity for pre-submission preparation may have impacted negatively on the outcome of the competition and affected the quality of the submissions.

In total 52 enquiries about the bid were received and 11 entries were submitted. Before the bid deadline UNESCO sent out a two page amendment informing bidders of changes in evaluation criteria and notifying them that His Highness Dr Sheik Sultan Bin Mohammed Al Qassimi, the Ruler of Sharjah and a Supreme Council member of the United Arab Emirates (donor of the project) had reduced the area of the plot available from 2sq km to 1sq km. Bidders were told that the terms of reference and the technical documents remained otherwise unchanged.

Companies tending for the bid may have inferred that the only change to the project was that the area of the land available for development was being halved. It is our understanding that the decision to develop a separate Desert Garden on an adjacent site (hitherto earmarked for the Qur'anic Botanic Garden proposal) was not communicated to the bidders.

GARY BARTSCH INTERNATIONAL (GBI) was selected to develop the Master Plan for the 'Sharjah Qur'anic Botanic Garden'. In the Fee Contract (24 July 2007) between UNESCO and GBI, it was stipulated that the landscape architectural firm, Ralph Oliver of London, should be subcontracted to ensure the 'cultural bases of the project'.

In the Request for Proposal (see above), it was stated that a two-stage procedure would be used to evaluate the proposals for the tender. The first stage involved judging bidders on their technical ability to carry out the project. Only those bidders who scored 70% or more would proceed to the second stage. At this stage 'the contract would be awarded to the firm/institute offering the lowest price' (point 21. Evaluation and comparison of proposals). According to the 'Record of Opening' carried out on 25 June 2007, the lowest price was offered by Linea of

Saudi Arabia (USD 200,000), followed by Ralph Oliver of London (USD 220,000) and then GARY BARTSCH INTERNATIONAL and Ralph Oliver of London (USD 229,600).

*Recommendations:*

- *For future Open International Competitions UNESCO should ensure a more realistic time frame to fully capitalise on the potential expertise available worldwide.*

### 4.2.2 Evaluation of Master Plan Manual – Qur'anic Botanic Garden in Sharjah

***Overall Design***

According to the Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan, 'The Qur'anic section should be the focal point of the whole garden. It should be located almost in the centre of the plot, and should be clearly identifiable from a distance' (p 31). In the questionnaire survey carried out by BGCI, stakeholders were asked their views on the relationship between the 'Qur'anic Garden' and the 'Desert Garden'. It should be recalled here that a significant majority of the stakeholders consulted for the evaluation thought that the garden should be designed in an integrated manner, while a similarly important proportion thought that the two gardens should be connected (see section 3.2.1)

In the current plan, the 'Qur'anic Garden' is located on the periphery of the overall design established Ralph Oliver of London. Situating the 'Qur'anic Garden' some 20 minutes walk away from the Heritage Village and the 'Desert Garden', may compromise the effective integration of both sites from a visitor perspective. Similarly, we are concerned that this arrangement may have a negative impact on maintenance, staffing, facilities and equipment. These issues are not addressed in the Master Plan Manual. In our view therefore, consideration should be given to how the management of the two garden sites is coordinated. In this context it should also be noted, that labeling section 12.0 of the Master Plan Manual as 'Qur'anic Botanic Garden Master Plan' could cause confusion as the document in its entirety articulates the elements of the Qur'anic Botanic Master Plan.

*Recommendation:*

- *In the implementation of the Master Plan for Sharjah consideration needs to be given to the integration of the 'Qur'anic Garden' and 'Desert Garden'*

*in terms of overall garden management and coordination between the two garden elements.*

### 4.2.3 Evaluation of the Site

Being close to the Desert/Wildlife Park, the Qur'anic Botanic Garden in Sharjah is very strategically placed. As regards the climatic conditions at the site it would be good to start collecting records from the actual site as soon as possible for future research. Even if there is not thought to be a big difference between the botanic garden site and the airport in terms of climatic conditions, it is valuable to have an accurate understanding of the site.

As regards the concerns about the sand, its movement could become a bigger issue than anticipated. However, the installation of drip irrigation and the plantings will have a significant effect on controlling sand movement (it is referred here to examples from Alice Springs Botanic Garden, Australia). While there will not be planting over the entire site, the effective placement of plantings will have a significant effect. With the likelihood of vegetation recovering when grazing is removed, the idea of 'coating' the sand should be considered carefully. If any such treatment is used, it is best done well away from the view of visitors as it can have a very unnatural feel and will, as it breaks up, not be attractive.

The comments on the site being better covered with vegetation without goat grazing is reasonable. Site changes at the Royal Botanic Garden in Jordan were enormous even in a few years – though the rainfall there is greater. Testing to see the change without grazing is being done at the Oman Botanic Gardens and it would be worth sharing results.

*Recommendation:*

- *It would be useful to start collecting data on the specific climatic conditions such as precipitation and evaporation rates, and wind speed in the site as early as possible to inform appropriate garden management measures. Information exchange with other gardens in the region and internationally such as with Oman Botanic Gardens and the Alice Springs Desert Park (Australia) will be useful to capitalize on experiences in the management of the relationship between sand movement and vegetation cover. Trial plots to record the effects of no grazing should be established.*

### 4.2.4 Evaluation of the Function of the Qur'anic Botanic Garden

The Ralph Oliver of London (ROL) design for the 'Qur'anic Garden' was submitted to GARY BARTSCH INTERNATIONAL for incorporation into the Master Plan Manual. ROL appears not to have been involved in discussions about where the garden should be located and did not carry out a site evaluation or an ecological survey. The 'Qur'anic Garden's' design is intended to reflect the description of paradise in the Holy Qur'an and symbols are incorporated into the many design features and elements throughout the garden.

The different elements proposed in the 'Qur'anic Garden' are intended to encourage a range of activities. These include adults and children exploring and planting a maze, climbing a Spiral Tower, listening to poetry readings, growing and cultivating plants and using a merry-go-round, designed to 'act as a turbine and water the plants in a particular area'. While we commend their relevance to raising environmental awareness, we are unclear whether these activities are consistent with the other expressed aim of the garden which is to '…provide an 'oasis in the desert' for peaceful reflection and tranquil contemplation...' (p 13). We note that the Master Plan Manual (section 6.0) acknowledges that as the garden is a 'Holy garden, people can pray at any location in the garden…' (p 42).

Further information needs to be provided whether – and to what extent – consideration has been given to how Muslim and non-Muslim visitors to the garden may be accommodated, so as to optimise their experience of the visit and at the same time safeguard the spiritual integrity of the landscape.

The 'Qur'anic Garden', as originally envisaged, was intended to be located at the hub of the garden complex and its entrances and exits reflected this central position. Given the 'Qur'anic Garden's' situation on the western edge of the complex, it may be argued that the west facing entrances and exits will be underused or even moribund. The current design does not accommodate this revision.

Running through the middle of the garden is a stream which is an important design component of the 'Qur'anic Garden'. From a Health and Safety point of view this can be considered as a potential hazard, and risk minimizations should be taken into account following relevant United Arab Emirates regulations. ROL reported that the stream would be shallow and that rocks and plantings would be placed along the length of the stream to discourage adults and children from

entering the water. From a sustainability point of view, consideration will also need to be given to the evaporation rates of the water.

In the north section of the garden an Amphitheatre is proposed that will have seating for 500 people. From conversations with people in the region, we understand that there are already several public venues inside and outside Sharjah that run a variety of regular events, including concerts. However, attendance is reportedly low. Given that the Garden will be located 35 km outside Sharjah, we recommend that a feasibility study is carried out to determine whether an amphitheatre is practicable.

*Recommendations:*

- *Further work should be undertaken to ensure the successful reconciliation of the two potentially contradictory aspirations of providing a space for 'exploration' and an 'oasis in the desert for peaceful reflection and tranquil contemplation'.*
- *Carry out a feasibility study to determine whether an amphitheatre will be used, particularly for religious readings.*
- *Give due attention to health and safety aspects, e.g. in the design of the stream running through the 'Qur'anic Garden'.*

#### 4.2.4.1 Education, Communication and Public Awareness

Education has been identified as one of the principle aims of the Project (Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan, p 19). Indeed the whole site presents itself as an ideal location for the successful delivery education, communication and public awareness programmes, which would support the implementation of Target 14 of the Global Strategy for Plant Conservation. Two Education Pavilions have been included in the Master Plan Manual – one in the Heritage Village and one in the 'Qur'anic Garden'. However, it is not clear how or whether the work of these two Pavilions will be coordinated and what the implications may be in terms of staffing or resources. If sufficiently staffed, the gardens would play a major role in raising environmental awareness.

As highlighted in this evaluation, consideration will need to be given to the availability of staff in the region. In Oman, for example, an expatriate 'expert' on education and interpretation has been appointed to develop the

education programme and train local staff. The post is for five years, following which time it is envisaged that the garden's education programme will be staffed entirely by nationals.

The criteria for the layout of the Education Pavilion located in the Heritage Village were lifted from the Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan (p 19 & 20). While this is understandable as far as the designer is concerned, there is no clear account in the Guidelines about the thinking or rationale behind this decision. We suggest that an analysis be undertaken to look at potential school visitor numbers, the peaks and flows of visits, the duration of visits and the types of activities relevant to the school curriculum. It would otherwise be difficult to correctly identify the facilities and equipment required. Advice could be sought from the Oman Botanic Gardens about how their schools' programme is being developed.

We would expect that schools visiting the 'Qur'anic Garden' and 'Desert Garden' would not be confined to the Educational Pavilions and their exploration of and engagement with the garden sites would be encouraged and facilitated. As mentioned below, the Master Plan Manual states that 'The main display areas are to consist of massed displays of desert species. These are to be organized in a logical and scientific way that will be easily understood by the lay-person, as well as being meaningful to specialists' (p 32). This suggests that plant displays will be laid out in a traditional manner, which in many botanic gardens has not been found to be the most inspirational and effective way to communicate conservation messages.

While the emphasis is placed on school education it should be noted that the gardens have enormous potential for informally educating and communicating with a wide range of different audiences and to encourage life-long learning. The gardens also have the potential and facilities to develop high quality training courses for capacity building in a range of subjects including horticulture, plant conservation and teacher training.

The above-mentioned Heritage Village was not included in the original Guidelines for Developing the Master Plan in Sharjah and it is our understanding that UNESCO is not in favour of this development. The Heritage Village was proposed by GARY BARTSCH INTERNATIONAL and in the minutes of a meeting, held from 7-9 September 2007 to review the Master Plan, it is stated that UNESCO had no objections to the inclusion of a cultural

village ‘as long as this proposal would be in the framework of the UNESCO mainline of action “enhancing cultural heritage with biological diversity conservation”. UNESCO recommended further development and offered a number of recommendations. To our knowledge, these recommendations have not been heeded.

The Heritage Village as proposed comprises: a trading village, a caravanserai, examples of plantings and a paradise garden. It also includes an orchard garden, a souk with mosque and market, royal square and education facilities. Gulistan gardens, sunken gardens and a Spanish garden complete the picture. It is difficult to identify exactly where these various elements are located in the Heritage Village and we attribute this to the confusing colour coding and lack of adequate labelling. Nevertheless, the idea of presenting the development of gardens through history is potentially rewarding from an educational perspective.

Following a meeting with GARY BARTSCH INTERNATIONAL in Dubai this July, we understand that the Master Plan Manual has been revised. We were told that the nursery for the garden has been relocated to the Heritage Village and now occupies the space allocated for the Education Pavilion. We do not know whether the Education Pavilion has been moved elsewhere. Given the explicit acknowledgement of the importance of education in the Guidelines and the original Master Plan Manual, we would recommend that steps be taken to confirm the continuing central role of education within the overall scheme.

*Recommendations:*

- *A draft strategy for education, communication and public awareness should be drawn up for the whole site to include how the ‘Qur’anic Garden’ and the ‘Desert Garden’ coordinate their work.*
- *Involve education staff in discussions about planting policies to ensure the gardens are communicating the conservation messages as inspirationally and effectively as possible.*

#### 4.2.4.2 Research

While the Qur’anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan provide a general idea of the key research areas, there remains a real need for the information to be presented in a more

structured manner such that it is possible to see not only what the department will be doing but also why in terms of the institution's mission. It would also be good to clearly identify what connections are sought with other institutions both regionally and internationally. An important example of the latter would be the Millennium Seed Bank as stated in section 4.2.1.

As with the horticulturists, the number of botanical researchers in the region is very small. This is where the idea of multiple institutions in the region becomes an issue. Looking at the suggested numbers in the staff list, it may have to initially include several expatriates who will be playing a key role in training nationals from the United Arab Emirates to build and strengthen in-country capacity.

The Heritage Village mentioned earlier (see section 4.2.4.1) is also intended to house the Centre of Excellence for Botanic Research. We note that there is no discussion in the Master Plan Manual about how this centre will function within the Heritage Village. It is difficult, therefore, in the absence of further and more detailed information, to comment on the viability of this arrangement.

However, in order to establish a centre of excellence in botanical sciences and research, it is suggested to form a conservation research consortium to include both conservation organisations and governmental/education partners. The consortium should also link horticultural and agricultural facilities/departments. If students are to be used as volunteers, it would be worth identifying where students have been used as volunteers in the region previously. Regional conservation groups may also be a source of volunteers.

Although *ex situ* conservation is at the core of the mission of botanic gardens, the integration of *ex* and *in situ* conservation measures remains an important objective to be promoted in the region. It would be of tremendous value if the botanic gardens could spearhead the development of research programmes aiming to integrate *ex* and *in situ* conservation. This will also be a direct contribution to Target 8 of the Global Strategy for Plant Conservation.

The maintenance of the plant records, at least initially, should be with the research group. This is largely because of the need to ensure that plants are properly identified and labelled to ensure that the garden is truly a 'botanic garden' rather than a park or display garden. As it is planned to establish a

regional network, it may be worth looking at promoting a common plant species record system used by all gardens in the region. E.g. BG Base has been in use for 20 years and has been developed specifically for botanic gardens across the world. Oman Botanic Gardens is one of the gardens using it and it provides a chance for further cooperative activity.

*Recommendations:*

- *Look at matching the numbers of research staff and the size of the facility with the likely number of people available to staff it.*
- *Identify where those staff are likely to be coming from and what will be required if it is desired to encourage the employment of local staff.*
- *Look at the incorporation of integrated conservation in the botanic gardens programmes so as to link both ex situ and in situ conservation in the region.*
- *Consider the use of a commonly used plant record system such as BG Base so as to further enable the networking among the gardens at regional and global levels.*

#### 4.2.4.3 Conservation

The objective of the Qur'anic Botanic Gardens Project to conserve and display the flora of arid ecosystems as the characteristic natural feature of the region is a very commendable endeavour. While many of these species are particularly well adapted to survive under extreme environmental (arid and hyper-arid) conditions, they have been neglected in conservation efforts and are underrepresented in *ex situ* collections of botanic gardens specially in the region itself. However, the plant diversity of arid ecosystems calls also for a wide array of horticultural techniques and skills if they are to be successfully propagated, maintained and organized in *ex situ* conservation collections. This knowledge is presently limited in the region, and capacity building and training in this area is of vital importance. This is considered to be a major challenge for the botanic garden in its early stages, and needs to be addressed as an issue of primary concern during the current garden development process.

*Recommendation:*

- *Capacity building and training in horticultural techniques is of primary importance to establishing new gardens. Training opportunities need to be provided from the outset in the planning process of a new garden.*

***List of plant species for the 'Qur'anic Garden' and the 'Desert Garden'***

While a comprehensive list of plant species to be represented in the 'Qur'anic Garden' and the 'Desert Garden' has been compiled with the input from a wide ranging team of international experts, this record should not be seen as a conclusive and static inventory and be reviewed and amended over time as related, further scientific insights and knowledge are gained. It will be particularly important to maintain contact with the IUCN/SSC Arabian Plant Specialist Group who are finalising a regional plant species red list and compiling a database and reference collection for the region. While, as in the case of the Qur'anic Botanic Garden in Sharjah, the Master Plan Manual has adopted the list of species as provided in the Guidelines, other planned botanic gardens may focus their *ex situ* conservation collections policy initially on priority species which are most at threat of extinction rather than aiming to represent the full species range of the region. Focused and prioritized *ex situ* conservation may be a practical choice in light of the capacity of the respective gardens as well as to manage limited funding. Target 8 of the Global Strategy for Plant Conservation (GSPC) of the Convention on Biological Diversity provides a guiding rationale to plan the garden's *ex situ* conservation policy and collection.

*Recommendations:*

- *The Qur'anic Botanic Garden in Sharjah, as well as other new gardens should design a living collections policy and associated species conservation programme carefully to take into account institutional capacity. It may be appropriate to prioritise species most at threat of extinction (in particular Critically Endangered and Endangered species – as and when data become available) for scientifically rigorous ex situ conservation whilst at the same time cultivating other threatened species for targeted research for example on phenology, pollination studies and propagation techniques. The display and interpretation of threatened species, for example over-exploited medicinal species should also be considered.*

- *Species conservation programmes should take into account the requirements of the Global Strategy for Plant Conservation, make use of the guidelines provided by the International Agenda for Botanic Gardens in Conservation and use the procedural material given in the Darwin Technical Manual for Botanic Gardens. These documents are available in Arabic.*

Specific caution is called for in the use of the correct scientific names of the species as various misspellings have been noted. These need to be addressed to guarantee the quality and accuracy of the plant records in the data base management tools used by the garden as well as for the production of scientifically sound plant labels.

To enable regional and global conservation reviews and assessments, the garden should make the information about the *ex situ* collection available at global level, in formats such as entailed in PlantSearch of BGCI.

*Recommendations:*

- *The list of species to be considered in the 'Qur'anic' and the 'Desert Garden' respectively should be periodically reviewed in terms of comprehensiveness and the scientific orthography.*

- *The new garden should endeavour to integrate information on its species and specimens held in ex situ collections in a global database, such as in BGCI's PlantSearch data base module.*

***Species referenced in the Holy Qur'an***

On the basis of the expert consultation to undertake this evaluation it is suggested to pay further attention to the 'talh' (referenced in Al-Waqi'a 56). Scholars are undecided as to whether this is the banana plant or a species of *Acacia* (Plants of the Bible and the Quran, L. J. Musselman, 2007). According to the same source, the listed taxa for mustard – *Brassica* – for which there seems to be no evidence that it was grown as a crop in ancient times, as well as for cucumber – *Cucumis* – require further scientific research related to their citation in the Holy Qur'an.

It has also been suggested to review whether it is useful to include *Terminalia catappa* as a shade-providing pathway tree; this is a deciduous to semi-deciduous species.

*Recommendation:*

- *The list of plants to be displayed in the Qur'anic Garden should be kept up-to-date regularly with latest scientific research findings on species referenced in the Holy Qur'an.*

***List of species for the 'Desert Garden'***

As already stated in the evaluation report, from a conservation point of view, the value of the 'Qur'anic Garden' is tremendously amplified with the *ex situ* conservation collections of species from arid ecosystems of the Arabian Peninsula.

While horticultural challenges (see above) will remain a key factor in the success of the garden, management and monitoring of potentially invasive species needs to be closely observed. One species – *Prosopis juliflora* – native to Mexico is notoriously known for its invasive potential in the drylands of the Old World, and it is strongly suggested that it be removed from the list of species to be conserved in the 'Desert Garden'. It is pointed out here however that under controlled conditions, this species could be used as a 'theme' to raise public awareness about invasive species in arid ecosystems. In the same vein, while a wide range of other activities for educational purposes can be thought of, a display area for the theme of convergent evolution in regard to water stress could be created, exhibiting examples of the phenotype of Euphorbiaceae in the Old World compared to Cactaceae in the New World.

*Recommendations:*

- *The selection of species to be planted and conserved ex situ in the 'Desert Garden' needs to consider the potential of certain species to become invasive. Prosopis juliflora, an alien invasive species should be displayed under controlled conditions only primarily for public awareness and education.*

- *The new garden should engage in the development of integrated practical programmes and projects linking ex situ and in situ conservation on the ground.*

### *'Site components' for conservation*

The Master Plan Manual of the Qur'anic Botanic Garden in Sharjah mentions plot no 525/C (100 ha in size) dedicated to the conservation of the Arabian flora and designated to be a 'Desert Botanic Garden' (p 1). To be located at its core, the 'Heritage Village' is suggested to house the 'Centre of Excellence for Botanic Research and an Educational Pavilion'. In addition, 'there will be designated areas in the Desert Garden for recreation' (p 1). The conservation dimension of the Arabian flora is addressed by 'The main botanic display would be a landscaped area with the primary function of displaying botanic specimens for the purposes of education, preservation and research' (p 28), however the content of the conservation aspect appears to be predominantly oriented towards public awareness. 'This component would cover the largest area of the Botanic Garden, needing specific facilities that would enable visitors to experience it' (p 28). 'The main display areas are to consist of massed displays of desert species. These are to be organized in a logical and scientific way that will be easily understood by the lay-person, as well as being meaningful to specialists. Beyond the main display area will be more naturalistic desert planting that is phased into untouched desert' (p 32). There is no mention however, on the requirements and scientific concepts to establish viable and genetically representative *ex situ* collections.

It is understood that the nursery has been moved from its original location along the southern boundary of the Qur'anic Botanic Garden site, into the Heritage Village complex. While no proper assessment can be provided at this point as information on this change in the plan has not been made available officially, it is pointed out here that the nursery is a key element to achieve the conservation mission of any botanic garden; it should be 'up and running' well before the garden development starts.

While it is highly commendable that the Master Plan Manual considers sustainable energy options, no plan is elaborated upon regarding the recycling of accumulating plant material. Production of new soil material on the basis of a sound composting practice needs to be seen as an integral part of any major botanic garden development.

*Recommendation:*

- *The Master Plan for Sharjah should place the 'site components' particularly relevant for conservation more into context of the diversity of the species it aims to represent in ex situ conservation collections, latter including requirements for collection management (display, exhibition, thematic collections, collections for conservation), horticultural maintenance and related capacity building needs, as well as structural and organizational issues, including species acquisition, plant records system, plants labeling, etc. The conservation function needs to be aligned and coordinated with the larger vision of the garden that integrates education, research and conservation.*

### 4.2.5 Additional Key Considerations

***Water***

Irrigation is going to be a major aspect of the garden management towards achieving the highly commendable sustainability goal stated in the Master Plan Manual. Evaporation rates are anticipated to be high and open water bodies, such as the stream running through the 'Qur'anic Garden' need to be designed so as to minimise evaporation to the extent practicable. It is considered to be important to conceive an overall 'irrigation' strategy that integrates water needs of both the 'Qur'anic' and the 'Desert Garden'.

The quality of water supply requires to be addressed in more detail. As the plant species to be displayed and conserved in the garden show tremendous differences regarding their need of water quality and composition (e.g. salinity), appropriate technology – such as a reverse osmosis system – needs to be made available to guarantee the adequate water quality. Related systems of considerable capacity may be required to provide sufficient clean water.

Further measures on waste water treatment and recycling are strongly encouraged not only in terms of environmental sustainability; it may considerably contribute to promote the garden as a model for wise use of water in the region and internationally.

***Staffing***

The issue of 'staffing' requires serious attention as the rationale for staffing levels is not readily apparent. To illustrate the point, it is proposed in Education to

employ a Director, a Head of Education, an Events PR Officer and a Manager (at secondary school level). Given the range of facilities planned, namely the provision of two classrooms, a theatre/multimedia room and a lecture hall, as well as the outside space, it is questionable whether this staffing provision is adequate. The garden may consider revisiting this question.

It is possible that the majority of staff with some experience that are currently available in the United Arab Emirates are expatriates (see also section 4.2.4.2). Even if it is decided that the majority of the staffing, and particularly the horticultural staffing is to be achieved by using expatriate staff, the capacity of the majority of the current expatriate staff is limited too. There will be a considerable need for capacity training among those (or in country staff) if it is intended to realise a Centre of Excellence. Existing capacity in the region, such as training opportunities provided by the Oman Botanic Gardens should be strongly sought for in the early days of the garden.

***Garden Visitors***

The Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan state that estimates of the number of annual visitors to the garden are necessary (p 25). In addition we would recommend that data in respect of the seasonal flow of visitors be collected. Comparative analysis of equivalent data from other, analogous, visitor attractions would be useful.

***Access to the Garden***

There are six approaches to the 'Qur'anic Garden' – two pedestrian/taxi paths, two pilgrimage walks and one service road. We note that in the current plans the two pilgrimage walks do not appear to have any trees marked along their route. In the absence of any more detailed information we would note the importance of shade and rest areas especially for elderly people, young children and people with disabilities. We would further recommend that a walking time analysis of the various routes throughout the gardens be carried out to provide data for future traffic and transport provision within the site.

In addition, the Master Plan Manual does not include specific information about interpretation and signage in the 'Qur'anic Garden'. The need for this was mentioned in the guidelines and it should be noted that signage is essential for people to orientate and navigate their way through the garden.

***Visitor Parking***

An unusual feature of this plan is the location of the visitor parking around the Heritage Village and inside the garden site. BGCI is unaware of this configuration in any other botanic garden and we would recommend that further consideration be given to the viability of this part of the proposal, especially with respect to visitor flows and health and safety issues. Equally, the Master Plan Manual states that 'it is important that noise levels need to be kept to the minimum if the ambiance that is being developed is to succeed' (p 83).

One of the Visions for the garden is that it should become a model of sustainability. It may be argued that relocating the car parks to the perimeter of the garden would enable this particular criterion to be addressed more effectively and perhaps also offer opportunities for showcasing alternative, environmentally sensitive modes of transport as suggested in section 15.0 of the Master Plan Manual (p 83). We recommend that this part of the plan is re-evaluated and consideration is given to relocating car parking at the perimeter of the garden.

***Facility Block***

The Facility Block, near the Children's Pavilion, does not appear to allow the ingress of natural light. This may challenge a conducive environment for the staff working therein.

# 5 The Future – Summing up and Overview of Recommendations

## 5.1 Summing up

The development of the pilot garden in Sharjah as a step towards the overall achievement of a Qur'anic Botanic Gardens Network is highly desirable from cultural and ecological perspectives and is broadly welcomed within the region. Developing the garden with its multi-functional roles is an ambitious undertaking. Site design and development need to be integrated with the planning of research, education and conservation objectives from the outset and human capacity to deliver on all aspects needs to be considered carefully. The development of the network can proceed in parallel if ongoing activities within the region are built on. The overall Qur'anic Botanic Gardens Network project is complex and is effectively a blueprint for the conservation of plant resources throughout the region in a culturally appropriate way. As such this will help to implement and build on the Global

Strategy for Plant Conservation (GSPC) interpreted in an Arabic context. Working practices that blend different intellectual approaches will be required. To the extent practicable, it is recommended that planning processes both for the pilot garden and the network are widely inclusive, designed so that the planning is in itself a learning process.

It will be important to ensure that regional expertise is effectively coordinated and that there are mechanisms for developing common protocols and standards. The following recommendations drawn from different sections of the evaluation report are presented together for further consideration.

## 5.2 Overview of Recommendations

### A ) Qur'anic Botanic Gardens Network

***Relevance***

To ensure the successful integration of function and design of new gardens in the region to form part of the Qur'anic Botanic Gardens Network it will be important to fully capitalize on the lessons learnt in conceptualizing and implementing the initial pilot garden projects.

A short but concise rationale of the functional relationship between the 'Qur'anic Garden' and the 'Desert Garden' will inform the planning process for new gardens and will help to promote the Qur'anic Botanic Gardens Network to other regions of the world while ensuring cohesive identity.

***Effectiveness***

It is important to first create an operating example of a 'centre of excellence' to be a model botanic garden that can function both independently and collaboratively.

A continued involvement with the Arab Botanic Gardens Network should be considered. Funding for a small secretariat (one staff person) would greatly facilitate this process.

Interaction with relevant organisations/institutions already operating or in the process of being developed should be further enhanced, including links with universities and conservation organizations. Specifically, contacts should be maintained and strengthened with the IUCN/SSC Arabian Plant Specialist Group which has 87 members from 11 countries.

The establishment of a capacity building action programme addressing all dimensions of botanic garden development requires to be addressed as the linchpin of any new garden conceived under the Qur'anic Botanic Gardens Network.

***Efficiency***

Take further advantage of related experience gained and lessons learnt in the region and internationally to contribute to maximised efficiency and cost-effectiveness in the use of resources.

***Utility***

Following a proposed wide publication of the evaluation results of the Qur'anic Botanic Gardens Project, UNESCO may like to consider organising an international seminar with relevant stakeholders to debate the linkages between biodiversity conservation, botanic gardens and Islam, which will offer an opportunity to showcase progress and challenges in implementing the Project.

***Sustainability***

Consider how the newly conceived botanic gardens will relate to government and other institutions taking into account both those aspects of the botanic garden that will always require financial support and those capable of producing funding for the garden or running contracted businesses.

**B) Recommendations for the Master Plan of the Qur'anic Botanic Garden in Sharjah**

**i) Sharjah Master Plan Development Process**

***Qur'anic Botanic Garden in Sharjah – Guidelines for Developing the Master Plan***

Future guidance to establish the master plan of a proposed garden should be made available in a cohesive structure using e.g. the sequence of a Strategic Plan; Facilities Plan; and Operating Plan.

***Open International Competition***

For future Open International Competitions UNESCO should ensure a more realistic time frame to fully capitalise on the potential expertise available worldwide.

### ii) Evaluation of Master Plan Manual – Qur'anic Botanic Garden in Sharjah

***Overall design***

In the implementation of the Master Plan for Sharjah consideration needs to be given to the integration of the 'Qur'anic Garden' and 'Desert Garden' in terms of overall garden management and coordination between the two garden elements.

***Evaluation of the Site***

It would be useful to start collecting data on the specific climatic conditions such as precipitation and evaporation rates, and wind speed in the site as early as possible to inform appropriate garden management measures.

Information exchange with other gardens in the region and internationally such as with Oman Botanic Gardens and the Alice Springs Desert Park (Australia) will be useful to capitalize on experiences in the management of the relationship between sand movement and vegetation cover. Trial plots to record the effects of no grazing should be established.

***Evaluation of the Function of the Qur'anic Botanic Garden***

Further work should be undertaken to ensure the successful reconciliation of the two potentially contradictory aspirations of providing a space for 'exploration' and an 'oasis in the desert for peaceful reflection and tranquil contemplation'.

Carry out a feasibility study to determine whether an amphitheatre will be used, particularly for religious readings.

Give due attention to health and safety aspects, e.g. in the design of the stream running through the 'Qur'anic Garden'.

***Education, Communication and Public Awareness***

A draft strategy for education, communication and public awareness should be drawn up for the whole site to include how the 'Qur'anic Garden' and the 'Desert Garden' coordinate their work.

Involve education staff in discussions about planting policies to ensure the gardens are communicating the conservation messages as inspirationally and effectively as possible.

***Research***

Look at matching the numbers of research staff and the size of the facility with the likely number of people available to staff it.

Identify where those staff are likely to be coming from and what will be required if it is desired to encourage the employment of local staff.

Look at the incorporation of integrated conservation in botanic gardens' programmes so as to link both *ex situ* and *in situ* conservation in the region.

Consider the use of a commonly used plant record system such as BG Base so as to further enable the networking among the gardens at regional and global levels.

***Conservation***

Capacity building and training in horticultural techniques is of primary importance to establishing new gardens. Training opportunities need to be provided from the outset in the planning process of a new garden.

***List of plant species for the 'Qur'anic Garden' and the 'Desert Garden'***

The Qur'anic Botanic Garden in Sharjah, as well as other new gardens should design a living collections policy and associated species conservation programme carefully to take into account institutional capacity. It may be appropriate to prioritise species most at threat of extinction (in particular Critically Endangered and Endangered species – as and when data become available) for scientifically rigorous ex situ conservation whilst at the same time cultivating other threatened species for targeted research for example on phenology, pollination studies and propagation techniques. The display and interpretation of threatened species, for example over-exploited medicinal species should also be considered.

Species conservation programmes should take into account the requirements of the *Global Strategy for Plant Conservation*, make use of the guidelines provided by the *International Agenda for Botanic Gardens in Conservation* and use the procedural material given in the *Darwin Technical Manual for Botanic Gardens*. These documents are available in Arabic.

The list of species to be considered in the 'Qur'anic' and the 'Desert Garden' respectively should be periodically reviewed in terms of comprehensiveness and the scientific orthography.

The new garden should endeavour to integrate information on its species and specimens held in *ex situ* collections in a global database, such as in BGCI's PlantSearch data base module.

***Species referenced in the Holy Qur'an***

The list of plants to be displayed in the 'Qur'anic Garden' should be kept up-to-date regularly with latest scientific research findings on species referenced in the Holy Qur'an.

***List of species for the 'Desert Garden'***

The selection of species to be planted and conserved *ex situ* in the 'Desert Garden' needs to consider the potential of certain species to become invasive. *Prosopis juliflora*, an alien invasive species should be displayed under controlled conditions only primarily for public awareness and education.

The new garden should engage in the development of integrated practical programmes and projects linking *ex situ* and *in situ* conservation on the ground.

***'Site components' for conservation***

The Master Plan for Sharjah should place the 'site components' particularly relevant for conservation more into context of the diversity of the species it aims to represent in *ex situ* conservation collections, latter including requirements for collection management (display, exhibition, thematic collections, collections for conservation), horticultural maintenance and related capacity building needs, as well as structural and organizational issues, including species acquisition, plant records system, plants labeling, etc. The conservation function needs to be aligned and coordinated with the larger vision of the garden that integrates education, research and conservation.

**Additional Key Considerations**

To conclude, a number of additional suggestions are made on key aspects in the development of the garden related to Water, Staffing, Garden Visitors, Access to the Garden, Visitor Parking, and Facility Block.

# 6 Annexes

ANNEX 1: Terms of Reference for Evaluation

ANNEX 2: Global Strategy for Plant Conservation (GSPC)

ANNEX 3: Questionnaire Survey

ANNEX 4: Stakeholder Consultation

ANNEX 5: Number of Botanic Gardens in the Arabian Peninsula, Middle East, North Africa and West Asia (BGCI GardenSearch)

ANNEX 6: National Accounts of Plant Species Diversity in the Arabian Peninsula, Middle East, North Africa and West Asia

**ANNEX 1**

# Terms of Reference for Evaluation

# Qur'anic Botanic Gardens Network

# QURANIC BOTANIC GARDENS NETWORK

## TERMS OF REFERENCE FOR EVALUATION

### BACKGROUND

UNESCO developed a project proposal "Quranic Botanic Gardens network" in 2005. The proposal was based on Main Line of Action "Enhancing linkages between cultural heritage and biodiversity conservation". In this case the Holy Quran, as a major element of the cultural heritage of the Arab States in the Gulf, refers multiple times to the importance of plant life on Earth, and the importance to respect trees, shrubs, grass, all plants, and all life in general, as well as water. In the UNESCO proposal, this cultural element was combined with a call for the ex situ conservation of the indigenous plants that occur naturally in the Arabian Peninsula (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Yemen), as well as those plants that are mentioned in the holy book.

The proposal suggests establishing a network of botanic gardens in the region, including centres of excellence for botanic education, research, and conservation. This, UNESCO recognizes, is highly important, in view of the deteriorating botanic taxonomic and vegetation ecological capacity, as well as the rapid development of natural habitats into urban ecosystems, and the associated loss of biodiversity. This network will be a major contribution for capacity building and biodiversity conservation, especially because of the lack of true botanic gardens in the entire Arab Region, with required elements of real botanic gardens: research, conservation, education.

UNESCO Doha developed the above proposal, and started a press campaign. Based on the press campaign, the Ruler's Office of Sharjah contacted UNESCO, invited them for a presentation of the proposed projects, and developed a Funds-in-Trust agreement. Based on this agreement a project manager was recruited to oversee all related activities and details, to invite for an international tender for the production of a master plan, to arrange for an International Advisory Committee meeting, produce guidelines, to evaluate the guidelines-based received offers, and to draft a contract for the winning landscaping company.

The master plan has been reviewed and revised, and has been handed over to the Ruler's Office in March 2008.

The importance of the continuous development of the botanic garden network was stressed during an Arab Botanic Garden Conference in Jordan, when the Sharjah Initiative was presented to the international botanic garden expert community, and delegates from Morocco, Palestine, Jordan, and Lebanon showed great interest joining the network by also establishing Quranic Botanic Gardens in their territories. A member of the Royal Jordanian Family discussed the issue with UNESCO Doha, and she verbally requested their support.

Maersk Oil Doha approached UNESCO, and suggested funding of a master plan for a garden in Qatar. This was discussed with Qatar's First Lady, and Qatar Foundation, and this master plan is now well on its way. The proposal was presented during the UNESCO General Conference, and it was discussed in more detail with UNESCO Headquarter colleagues from Central Services, Natural Sciences, Education and Culture in December 2007. This demonstrates the enormous potential this linkage of cultural heritage and biodiversity conservation has practically for all UNESCO member states.

**OBJECTIVES**

In line with sound practice in assessment of initiatives, UNESCO wishes to contract an evaluation of the Quaranic Botanic Gardens Network extra budgetary Funds in Trust project. The overall aim of the evaluation is to provide summative and formative assessments of the project which can inform decisions on implementation. The main objectives are to asses the relevance, utility (for Sharjah and for the UAE), effectiveness, efficiency and sustainability of the project. This will include assessment of the project deliverables and processes and their requirements for transferability to other sites in the region.

Specific issues to be covered are, a) the efficiency and cost effectiveness of the project: did it deliver as planned with proper fiscal probity with efficiency in the use of resources? b) effectiveness: What are the broader potential impacts of the initiative locally (for Sharjah, and the UAE), regionally and globally? What importance does the initiative have for capacity building, education, research, and conservation of biodiversity, with a special reference to the master plans being developed for Sharjah and Qatar?

c) relevance: how appropriate is the garden design and its associated facilities to the environmental, social and economic conditions of the site. How applicable to other sites and under what conditions?

d) utility: what interest has been generated in the uptake of the project and implementation of the garden locally and elsewhere. What are the information needs and interests of stakeholders in the region (and beyond) which need to be fulfilled in order to stimulate broader uptake of similar initiatives? For this aspect of the evaluation will be required the identification of, discussion with and reporting to potential stakeholders.

c) sustainability: what is required to maintain the intiative over the long term? What risks may be foreseen and opportunities may be foreseen in this respect and how may they best be managed?

**METHODS**

The tenderer should consider a range of data collection and analysis methods including stakeholder interviews, surveys, site visits, documentary review (including masterplan and reviews of it) and should set out a strategy for dissemination of the evaluation which best

meets the information needs of stakeholders with a potential interest in developing similar initiatives in their own context. Proposers should include a brief management plan for the work

**PROFILE OF EVALUATOR AND SELECTION**

The evaluator should have a professional background in Arabian botany / vegetation ecology, the need for the conservation of the Arabian flora, and the establishment / management of botanic gardens and botanic education and research centres. Knowledge of professional project evaluation will be an important asset. The evaluator can carry out the evaluation by him/herself, or invite additional professionals, as he/she may prefer.

Experience of the team should be demonstrated through listing relevant projects undertaken in the last 5 years and by inclusion of cvs of each team member. The proposer independent in relation to UNESCO and not be regular UNESCO staff. These professional criteria will be the main criteria applied to award the contract for the evaluation counting for 80 percent of the score awarded by the assessors of the proposal. The remaining 20 percent will cover the technical quality of the bid (namely its understanding of the task and the appropriateness of the approach to the issues set out for the evaluation in this Terms of Reference and the soundness of the planning and management of the work). Proposers should also note that in addition to the professional expertise and quality of the proposal, price will also be taken into account in order to ensure value for money.

UNESCO staff from Internal Oversight, Natural Sciences Sector, and Doha Office are available to support the evaluation activities, with more specific information on project evaluation, once the candidate has been identified and selected. Together they form the Reference Group. The role of the Reference Group will be to support and supervise the quality and the methodological rigour of the evaluation and provide guidance on the issues and approach to conducting the sounding of key stakeholders and the analysis of efficiency, effectiveness, relevance and utility of the project. The Reference Group will provide all the assistance it can to the evaluation in order to facilitate access to stakeholders, advise on methods and support ownership and uptake of the evaluation’s findings.

TIMING AND DELIVERABLES

Timescales are indicative but are as follows: Invitation of offers: 2. April, 2008; 30. April 2008: receive and evaluate offers, and identify successful candidate; issue contract; delivery of draft report: 30. August; delivery of final report for the Sharjah project. 30. November 2008: delivery of final report for the Qatar project. Deliverables will be as follows:

a. An initial workplan/inception report for the Reference Group to discuss and advise on specific approach and issues to be covered, by end of April, 2008.

b. A draft report and following Reference Group discussion, submission of a final report for the Sharjah activity. The draft report will be reviewed by the Reference Group and circulated among stakeholders for comments. Delivery of the draft report 30 August 2008.

c. A draft report and following Reference Group discussion, submission of a final report for the Qatar activity. The draft report will be reviewed by the Reference Group and circulated among stakeholders for comments. Delivery of the draft report 30 October 2008.

c) Following review in the light of comments two final reports will be delivered as soon as possible, and no later than by November 2008.

The reports should be in English and sent electronically as CDs (with an appropriate label on each CD) in word and pdf format. An Arabic summary of no more than 500 words should be included. UNESCO Doha is ready assisting this aspect. UNESCO Doha needs 100 copies of the CDs of each of the final reports.

INVITATION TO MAKE A PROPOSAL

Interested candidates are required to submit their up-to-date CV / CVs, and an elaborated covering letter of maximum 5 pages, stating how they understand the task, their proposed approach and management of the work. The letter should explain their fitness to provide the required service, including a budget breakdown, milestones, and timing. Answers must be received by 30. April 2008. Please use the following address: UNESCO Office in Doha, attn. Dr. Benno Boer, 66, Lusail Street - West Bay, POBox 3945, Doha, Qatar (tel ++974 4113290).

BUDGET AVAILABILITY

The total budget requirements for this evaluation should be around 25,000 US$ and must not exceed 30,000 US$, including consultant fees, travel costs, food and accommodation, printing costs, costs for sub-contracting experts and services, visa costs, and any other project-related costs. The value for money provided for the budget breakdown by the candidate will be one of the most important criteria for the selection of the successful candidate. At least ten candidates will be invited to submit offers. Please note, submit your offer in one envelop that contains the technical offer (sealed in a separate envelop marked as technical offer), and the financial offer with a budget breakdown (sealed in a second separate envelop marked a financial offer).

**ANNEX 2**

## Global Strategy for Plant Conservation (GSPC) – Targets for 2010

*(a) Understanding and documenting plant diversity*

**Target 1**:

A widely accessible working list of known plant species, as a step towards a complete world flora.

**Target 2:**

A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels.

**Target 3:**

Development of models with protocols for plant conservation and sustainable use, based on research and practical experience.

*(b) Conserving plant diversity*

**Target 4:**

At least 10 per cent of each of the world's ecological regions effectively conserved.

**Target 5:**

Protection of 50 per cent of the most important areas for plant diversity assured.

**Target 6:**

At least 30 per cent of production lands managed consistent with the conservation of plant diversity

**Target 7:**

60 per cent of the world's threatened species conserved *in situ.*

**Target 8:**

60 per cent of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes.

**Target 9:**

70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained.

**Target 10:**

Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems.

*(c) Using plant diversity sustainably*

**Target 11:**

No species of wild flora endangered by international trade.

**Target 12:**

30 per cent of plant-based products derived from sources that are sustainably managed.

**Target 13:**

The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted.

*(d) Promoting education and awareness about plant diversity*

**Target 14:**

The importance of plant diversity and the need for its conservation incorporated into communication, educational and public–awareness programmes.

*(e) Building capacity for the conservation of plant diversity*

**Target 15:**

The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.

**Target 16:**

Networks for plant conservation activities established or strengthened at national, regional and international levels.

**ANNEX 3**

# Questionnaire Survey

## Qur'anic Botanic Gardens Network

# QUR'ANIC BOTANIC GARDENS NETWORK

## SURVEY

UNESCO Doha has contracted Botanic Gardens Conservation International (BGCI) to carry out a formative and summative evaluation of the Project 'Qur'anic Botanic Gardens Network'. This Project proposes the establishment of a network of botanic gardens in the Arabian Peninsula as centres of excellence for plant conservation, research and education. The Project also strives to foster linkages between cultural identity and plant diversity evolved over millennia in relation to Islamic traditions and knowledge and the teachings of the Holy Qur'an.

As part of this project the development of two Master Plans has been initiated - one for Sharjah and one for Qatar. The evaluation carried out by BGCI will assess the progress and achievements of the Project to-date with the aim of informing decisions on its future implementation.

In your capacity as a member of the International Advisory Committee (for Sharjah or Qatar or both), we value your views and expertise on this project. We would like to invite you to contribute to this evaluation by completing the survey below. A copy of the evaluation report will made available to you by the end of this year.

| | | | | |
|---|---|---|---|---|
| Title: | | | | |
| Name: | | | | |
| Organisation: | | | | |
| Please tick your specific affiliation with the Project | IAC Sharjah | IAC Qatar | IAC Sharjah and Qatar | None (please specify your affiliation with the Project) |

### Part A: Qur'anic Botanic Gardens Network Project

1 Are you familiar with the document published by UNESCO entitled 'Quranic Botanic Gardens Project'? (Please tick)

Yes ☐ No ☐

2(i) If yes, how important do you believe the following elements of this Project are for the region? Please tick

| | Very important | Quite important | Not important |
|---|---|---|---|
| Plant conservation | | | |
| Education | | | |
| Plant research | | | |
| Capacity building (for example, of horticulturalists, and teachers) | | | |
| Teaching about the plants of the Qur'an | | | |
| Fostering cultural identity | | | |
| Visitor attraction | | | |
| I don't know | | | |

2(ii) If you ticked 'Very important' or 'Quite important' for any of the elements above, please give details of how the Project contributes to strengthening these elements in the region.

| | |
|---|---|
| Plant conservation | |
| Education | |
| Plant research | |
| Capacity building (for example, of horticulturalists, and teachers) | |
| Teaching about the plants of the Qur'an | |
| Fostering cultural identity | |
| Visitor attraction | |

3(i) Focusing specifically on the Qur'anic element of the Project, how important do you think the following functions are?

| | Very important | Quite important | Not important | Please give details |
|---|---|---|---|---|
| To provide a reflective space for Muslims | | | | |
| To educate Muslims about the link between plants, the teachings of the Holy Qur'an and Islamic traditions and knowledge | | | | |
| To offer a space for Islamic readings | | | | |
| To promote an understanding of plants and the Qur'an to non-Muslims | | | | |
| To provide a platform for inter-faith dialogue | | | | |

3(ii) If none of the above, please give details

4 What do you see as the main strengths and opportunities of this Project? Please be as detailed as you can

5 What do you see as the main challenges and threats to this Project? Please be as detailed as you can

6 Do you know of any countries that have demonstrated an interest in participating in this Project and establishing a Qur'anic Botanic Garden?

Yes ☐ No ☐

If yes, please give details (eg. name of country, whether funding has been secured or whether plans exist to develop a fundraising strategy)

| |
|---|
| |

**Part B: Master Plans for Sharjah and Qatar**

1(i) Have you seen a **published** copy of the following documents (please tick)

| | Yes | No |
|---|---|---|
| Qur'anic Botanic Garden in Sharjah: Guidelines for developing the Master Plan | | |
| Guidelines for the Qur'anic Botanic Garden in Qatar | | |

1(ii) If yes, do you think they are sufficiently comprehensive for developing the Master Plan in:

| | Yes | No |
|---|---|---|
| Sharjah | | |
| Qatar | | |

1(iii) If no, please give details

| | |
|---|---|
| Sharjah | |
| Qatar | |

2 What is your understanding of the progress of the Master Plans for Sharjah and Doha? Please tick as many boxes as you like:

| | Sharjah | Qatar |
|---|---|---|
| The site for the Garden has been selected | | |
| There has been an open international competition to select the landscape architect for the site | | |
| The Master Plan has been produced | | |
| The construction of the Qur'anic Botanic Garden is underway | | |
| I am not aware of the progress of the Master Plan/s | | |

3 Two distinct botanic gardens have been identified in the Master Plans – i) a Qur'anic garden which would grow plants mentioned in the Qur'an and ii) a Desert Garden which would grow plants from the region and represent regional ecosystem types. In your view, what should the relationship be between the two gardens? Please tick one of the boxes below:

| | |
|---|---|
| Integrated – the project should be one garden | |
| Connected – two gardens (Qur'anic and Desert) should be built on one site and connected | |
| Separate – two gardens (Qur'anic and Desert) could be located on separate sites | |
| Not important | |

Thank you very much for taking the time to complete this survey. Please return this survey to BGCI by **Friday 5 September 2008**. We would prefer this survey returned by email to Joachim.gratzfeld@bgci.org and Julia.willison@bgci.org. If this is not possible please send a hard copy to: Joachim Gratzfeld at Botanic Gardens Conservation International, Descanso House, 199 Kew Road, Richmond, Surrey TW9 3BW, UK.

**ANNEX 4**

**STAKEHOLDER CONSULTATION**

**Members of the International Advisory Committees for Sharjah and Qatar who commented on the questionnaire survey (*: Sharjah; **: Qatar; ***: Sharjah and Qatar)**

| | |
|---|---|
| Gary Bartsch * | Gary Bartsch, International Landscape Consultants, Sharjah / Abu Dhabi, United Arab Emirates |
| Anathea Brooks * | Liaison Officer, UNESCO Headquarters, Paris, France |
| Gary Brown ** | Kuwait Institute for Scientific Research, Kuwait |
| Giovanni Caniglia * | Padua Botanic Garden, Italy |
| Shaukat Ali Chaudhary * | Taxonomist Emeritus |
| Grant A. Donald * | CEO & Design Director, Silk Tree International, Abu Dhabi, United Arab Emirates |
| Dawud Mohammad Hassan Al-Eisawi * | University of Jordan, Amman, Jordan |
| David Elsworth * | BW&P Abroad, Associate Landscape Architects, Stuttgart, Germany |
| Shahina A. Ghazanfar * | Royal Botanical Gardens Kew, Richmond Surrey, United Kingdom |
| Saif Al-Hatmi * | National Botanical Garden, Muscat, Oman |
| Uwe Herpin *** | University of São Paulo, Brazil |
| Herbert Hurka * | Director, Osnabrück Botanic Garden, University of Osnabrück, Germany |
| Ajmal Khan * | Institute of Sustainable Halophyte Utilization, University of Karachi, Pakistan |

| | |
|---|---|
| Zahra Larsen * | Former PR and Liaison Officer, UNESCO Doha Office, Qatar |
| Abdul Aziz Al Midfa *** | Director General, Environmental and Protected Areas Authority, Sharjah, United Arab Emirates |
| Lucie Touma * | Ralph Oliver of London Landscape Architects, Sharjah, United Arab Emirates |

**Additional stakeholders who commented on the questionnaire survey**

| | |
|---|---|
| HRH Princess Basma Bint Ali of Jordan | Royal Botanic Garden, Jordan |
| Samira Omar Asem | Kuwait Institute for Scientific Research, Kuwait |
| Dilan Bayindir | Director of Education, Nezahat Gökyiğit Botanic Garden, Istanbul, Turkey |
| Mohamed Abdel Aziz M. El Demerdash | Botany Department, Faculty of Science, Mansoura University Cairo, Egypt |
| Kingsley Dixon | Kings Park and Botanic Garden, Perth, Australia |
| David Gallacher | Zayed University, Dubai, United Arab Emirates |
| Fazlun M. Khalid | Islamic Foundation for Ecology and Environmental Sciences, United Kingdom |
| Mike Maunder | Executive Director, Fairchild Tropical Botanic Garden, Florida, United States |
| Lytton John Musselman | Department of Biological Sciences, Old Dominion University Virginia, United States |
| Annette Patzelt | Oman Botanic Garden, Office for Conservation of the Environment, Diwan of Royal Court, Oman |
| Dennis J. Russell | American University of Sharjah, United Arab Emirates |
| Elsa J. Sattout | Agence Française de Développement, Beirut, Lebanon |

| | |
|---|---|
| Khaled Salem Sawalha | Al-Quds University Botanic Gardens, Palestine |
| Andrew Spalton | Oman Botanic Garden, Office for Conservation of the Environment, Diwan of Royal Court, Oman |
| Irina Springuel | South Valley University, Egypt |
| Mel Stewart | Former Engineering Advisor, The Ruler's Office, Sharjah, United Arab Emirates |

**Stakeholders interviewed during evaluation mission in Doha, Sharjah and Dubai**

| | |
|---|---|
| Rajab Yagout Abdulla | Ministry of Environment, Doha Qatar |
| L. Kay Allen | Green Projects, Qatar Foundation, Doha, Qatar |
| Khalid Hilal Al Anzi | Ministry of Environment, Doha Qatar |
| Gary Bartsch | Gary Bartsch, International Landscape Consultants, Sharjah / Abu Dhabi, United Arab Emirates |
| Benno Boer | UNESCO Ecological Sciences Advisor for the Arab Region, UNESCO Doha Office, Qatar |
| Peter Christensen | Senior HSE Advisor, Maersk Oil, Qatar |
| Grant A. Donald | CEO & Design Director, Silk Tree International, Abu Dhabi, United Arab Emirates |
| Ahmed El-Desouky El-Gharib | Green Projects, Qatar Foundation, Doha, Qatar |
| Hamed Bin Saif Al-Hammami | UNESCO Representative for the Arab States of the Gulf and Director of UNESCO Doha Office, Qatar |
| Paul Howard | Sharjah Natural History Museum and Desert Park, Sharjah, United Arab Emirates |
| Malda Jabbour | Programme Specialist for Culture, UNESCO Doha Office, Qatar |

| | |
|---|---|
| Peter Jackson | Architect, The Ruler's Office, Sharjah, United Arab Emirates |
| Mohammed Marafi | Green Projects, Qatar Foundation, Doha, Qatar |
| Abdul Aziz Al Midfa | Director General, Environmental and Protected Areas Authority, Sharjah, United Arab Emirates |
| Kerwin Porter | Curatorial Manager, Sharjah Aquarium, Sharjah, United Arab Emirates |
| Eulian Roberts | Managing Director, Qatar Science and Technology Park, Doha, Qatar |
| Dennis J. Russell | American University of Sharjah, United Arab Emirates |
| Mark Sutcliffe | Programme Assistant, UNESCO Doha Office, Qatar |
| Lucie Touma | Ralph Oliver of London Landscape Architects, Sharjah, United Arab Emirates |

**Stakeholders interviewed in the United Kingdom**

| | |
|---|---|
| Louise Allen | Curator, University of Oxford Botanic Garden, United Kingdom |
| Gail Bromley | International Consultant, Biodiversity Education & Community Manager, Royal Botanical Gardens Kew, UK |
| Deborah Dunham | Consultant, United States |

**ANNEX 5**

**Number of Botanic Gardens in the Arabian Peninsula, Middle East, North Africa and West Asia (BGCI GardenSearch)**

| Region | Country | Number of Botanic Gardens* |
|---|---|---|
| **Arabian Peninsula** | | |
| | Bahrain | |
| | Kuwait | 1 |
| | Oman | 3 |
| | Qatar | |
| | Saudi Arabia | 2 |
| | United Arab Emirates | |
| | Yemen | |
| **Middle East** | | |
| | Iraq | 2 |
| | Israel | 9 |
| | Jordan | 1 |
| | Lebanon | |
| | Palestinian Territory | 3 |
| | Syrian Arab Republic | |
| **North Africa** | | |
| | Algeria | 3 |
| | Egypt | 5 |
| | Libyan Arab Jamahiriya | 1 |
| | Morocco | 2 |
| | Sudan | 1 |
| | Tunisia | 4 |
| | Western Sahara | |
| **West Asia** | | |
| | Afghanistan | |
| | Islamic Republic of Iran | 3 |
| | Pakistan | 7 |

* For more information on the individual botanic gardens including their facilities and programmes of work, please go to: http://www.bgci.org/garden_search.php

**ANNEX 6**

## National Accounts of Plant Species Diversity in the Arabian Peninsula, North Africa and West Asia

| Country | Native Vascular Species[1] | Endemic Species[1] | Other Sources |
|---|---|---|---|
| **Afghanistan** | 4,000 | 800 | |
| **Algeria** | 3,164 | 250 | |
| **Bahrain** | 248 | 0 | 307[2] |
| **Egypt** | 2,076 | 70 | |
| **Iraq** | 3,000 | 190 | |
| **Islamic Republic of Iran** | 8,000 | 1,400 | |
| **Israel** | 2,225 | 165 | |
| **Jordan** | 2,100 | 145 | 2,100-2,500[2] |
| **Kuwait** | 282 | 0 | |
| **Lebanon** | 2,600 | 311 | |
| **Libyan Arab Jamahiriya** | 1,825 | 134 | |
| **Morocco** | 3,675 | 625 | 4,979[3] |
| **Oman** | 1,200 | 73 | 1,204[2] |
| **Pakistan** | 5,100 | 400 | |
| **Palestinian Territory** | ? | ? | |
| **Qatar** | 306 | 0 | |
| **Saudi Arabia** | 2,028 | 34 | 2,250[2] |
| **Sudan** | 3,132 | 50 | |
| **Syrian Arab Republic** | 3,100 | 395 | |
| **Tunisia** | 2,196 | ? | |
| **United Arab Emirates** | 340 | 0 | 630[2] |
| **Western Sahara** | 330 | ? | |
| **Yemen** | | | 2,000[2] |
| Yemen (North) | 1,650 | 58 | |
| Yemen (South) | 1,180 | 77 | |
| Yemen (Socotra) | 815 | 230 | |

References:


1 WWF and IUCN (1994-1995) Centres of Plant Diversity. A guide and strategy for their conservation. 3 Volumes. IUCN Publications Unit, Cambridge, UK.

2 Arabian Plant Specialist Group (www.iucnarabianpsg.org) Accessed 28th October 2008.

3 The Darwin Plant information system for Morocco and the Inventory of Moroccan plants. Reading University http://www.herbarium.rdg.ac.uk/moroccan_plants/moroccan%20plants/main.asp Accessed 28th October 2008.