Rays of Hope from the Ecological Restoration Alliance of Botanic Gardens, following its recent meeting in Amman, Jordan

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In the spring of 2015, the Ecological Restoration Alliance (ERA) of Botanic Gardens held its fourth international meeting in Amman, Jordan, hosted by the Royal Botanic Garden of Jordan. Three regional working groups were launched, for the Middle East, East Africa, and Latin America, and new partnerships were forged to support ecological restoration initiatives led by botanic gardens in Jordan, Oman, and elsewhere. A one-day public symposium, attended by over 100 people, was also held—the most significant public meeting on ecological restoration held to date in the Middle East. A communications strategy for regional outreach was agreed upon starting with the translation of several Society for Ecological Restoration (SER) foundation documents into Arabic. A peer-reviewed translation of the SER International Primer on Ecological Restoration has already been produced by staff of the Royal Botanic Garden of Jordan and posted on the SER website. Further efforts will be made to promote public awareness in Jordan and regionally, in support of existing conservation and restoration programs, and to promote greater integration of ecological restoration programs in national and regional development schemes and government policies. Key action points were agreed upon to promote the practice of ecological restoration and the role of botanic gardens globally vis-à-vis policy makers and funders.

Key words: dryland ecosystems, hubs, long-term restoration sites, Middle East, science-based ecological restoration, SER Primer in Arabic

Implications for Practice

• The Ecological Restoration Alliance of Botanic Gardens held its fourth international meeting in Amman, Jordan.
• In the Middle East and most of the developing world, there is important need for restoration and a shortage of centres of excellence and training.
• Through mutual support and collaboration, botanic gardens and similar institutions can help address this need (and opportunity) by creating hubs and long-term restoration sites.
• A strategy for regional outreach and action in the Middle East was agreed, including translation of several SER foundation documents into Arabic.
• A translation of the SER International Primer on Ecological Restoration has already been produced by staff members of the Royal Botanic Garden of Jordan, and it has been posted on the SER website.

Introduction

The Ecological Restoration Alliance (ERA) of Botanic Gardens is an international consortium open to botanic gardens, arboreta, and similar institutions (hereafter “botanic gardens”) (see Aronson 2014; Shaw et al. 2015). The ERA was founded in 2011 by 15 leading botanic gardens active in ecological restoration, in recognition of the unique set of skills such institutions offer to ecological restoration (Hardwick et al. 2011), and with the aim of mobilizing such institutions worldwide to respond to The United Nations’ Convention on Biological Diversity’s target to restore 15% of the world’s degraded ecosystems by 2020 (CBD 2012). Its objective is to share the skills, resources, experience, and plant materials of botanic gardens to scale up and mainstream science-based restoration activities globally. The ERA is based on the premise that botanic gardens are well equipped with professional staff and resources, as well as the long-term view, which are all so important for effective ecological restoration (Hardwick et al. 2011). A network of long-term ecological restoration sites for research and development, training, demonstration, and outreach is a key objective of the Alliance.

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Summary of the Meeting and Public Symposium

Key next steps for the ERA were agreed during the course of the meetings in Amman. Over the next 5 years:

1. The ERA will strategically enlarge its membership to bring in botanic gardens from the Botanic Gardens Conservation International (BGCI) network that will strengthen existing skills for restoration held by the ERA. This will include botanic gardens with experience carrying out species reintroductions, germination of difficult species, management of invasive species, and other specialist skills not often found in other institutions.

2. The ERA website (www.erabg.org) will offer a comprehensive and searchable directory of expertise of ERA members, projects around the world led by, or involving, ERA members, and members offering consultancy and restoration support internationally. The ERA will expand its portfolio of long-term restoration projects to cover a more diverse range of habitats and cultural contexts, providing sites for research, demonstration, and training. A particular focus will be to help botanic gardens in developing countries around the world to carry out and promote restoration that also is job- and livelihood-oriented and integrated into sustainable local economic development plans.

3. To improve the evaluation of restoration actions, including assisted natural regeneration of native flora and fauna, a series of metrics will be developed to enable the ERA to track progress over the next five years and beyond.

4. The ERA will continue to promote the practice of science-based ecological restoration and the role of botanic gardens to policy makers and funders.

Achieving these actions will rely on leveraging additional funding, strong commitment from ERA members, and coordination from BGCI.

In addition to the ERA business meetings, a one-day public symposium was organized on “Restoring Degraded Ecosystems: Regional and International Perspectives,” the most significant public meeting to date on ecological restoration in the Middle East. The symposium drew over 100 participants from academia, government agencies, NGOs, and funding agencies operating in Jordan and several other Middle Eastern countries (Fig. 1). Key stakeholders and decision makers attended the symposium, including members from the Ministry of Agriculture and Ministry of Environment that can make an impacted decision for ecological restoration in Jordan.

Presentations were made by 18 international and regional experts from 12 countries who offered perspectives on advances achieved and challenges confronted when addressing restoration of degraded ecosystems in developing countries. The symposium provided a platform to engage regional stakeholders and highlight the unique capacity of botanic gardens. By mobilizing their skills, expertise, resources, and experience in horticulture, botanical science, ecology, environmental education, and other related disciplines, botanic gardens have much to contribute to science-based and community-based ecological restoration efforts.
A Ray of Hope from Jordan

Much of the discussion at the ERA business meetings and the public symposium was devoted to deserts and drylands, as well as the densely populated landscapes with Mediterranean climate in North Africa and much of the Middle East. A follow up communiqué from the Amman meeting was prepared and circulated to governments in the region (http://m.alrai.com/article/707836.html). This included a call for recognition of the need to work collaboratively, across international borders, for ecological restoration to be undertaken accompanied by environmental education programs, greater support for applied research, and capacity building.

Links were forged and strengthened between staff at the Royal Botanic Garden of Jordan (RBGJ) and other ERA members, who are now working together to share propagation knowledge and develop germination protocols for native trees, with high potential for restoration. A standard template has been developed for recording propagation protocols, which the RBGJ, Tooro Botanical Garden in Uganda, and Bracken-hurst Botanic Garden in Kenya are using (all are members of the ERA). Propagation trials have been undertaken and results recorded for 23 Jordanian tree species and 45 East African species. This information will be added to BGCI’s PlantSearch database, a global database of living plant, seed, and tissue collections (https://www.bgci.org/plant_search.php) and produced as leaflets for local use during 2016.

Key restoration texts are also being translated into Arabic by staff from the RBGJ and will be disseminated widely. A peer-reviewed translation of the SER International Primer on Ecological Restoration has already been produced by staff, and it has been posted on the SER website (see http://ser.org/resources/resources-detail-view/ser-international-primer-on-ecological-restoration).

The ERA meeting in Amman brought together five botanic gardens from the Middle East (RBGJ, Oman Botanic Garden, Al Quds University Botanic Garden, Palestine, Green Hands Botanic Garden, Lebanon, and Sulaimani Botanic Garden, Iraq) plus the Royal Botanic Gardens, Kew (RBG Kew) and the Royal Botanic Garden Edinburgh (RBGE), both of which have staff actively working in the Middle East. All of them are developing long-term visions and development programs for ecological restoration, to be backed with seed banks, herbaria, trained horticulturists and botanists, a native species focus, and with community outreach. These institutions are aligning with local needs, international policy to which their governments have made commitments, and are exemplars of the current botanic garden mandate, as outlined in the International Agenda for Botanic Gardens in Conservation, 2nd ed (BGCI 2012).

Support from ERA members for organizations in the Middle East is essential as there is still a lack of expertise in the science and practice of ecological restoration in the region. Concurrently, there is a clear need for strong collaboration between national organizations working on restoration in the Middle East. The growing collaboration between RBGJ and the Oman Botanic Garden (OBG) is a good case in point. In September 2014, three OBG staff members visited the RBGJ, to share information on herbarium, virtual herbarium, and seed banking techniques. The OBG researchers also joined the RBGJ team for 5 days in the field. In November 2015, executive management from RBGJ visited the OBG where they discussed further cooperation plans and the importance of leading the region together in ecological restoration. Both RBGJ and OBG have also been working closely with ERA members from Europe and North America. There has been a twinning program with RBG Kew, which involved reciprocal visits of researchers between Jordan and the United Kingdom, training on herbarium techniques, preparing an up-to-date Flora of Jordan, and training on IUCN red listing. At present, RBGE is training the head botanist from RBGJ in GIS techniques and will be closely involved in the direction and completion of his PhD thesis at the University of Edinburgh in which he will improve the outdated phyto-geographical map of Jordan, with special focus on the implications for conservation and restoration.

RBGJ has also recently signed a memorandum of understanding with the Missouri Botanical Garden (MBG) in order to develop an on-going institutional relationship in the form of a partnership. Furthermore, with contacts made through the ERA, scientists from MBG, OBG, RBGJ, RBG Kew, RBGE, and Yemen are all collaborating on a study of widely distributed trees with economic uses transported throughout the Middle East since ancient times. The implications of these trees’ ecology and distribution patterns could be significant for planning of restoration, conservation, adaptive management, and sustainable development projects throughout the region. A first multi-author article has been prepared and submitted for publication in an appropriate scientific journal. Further collaboration on molecular genetics, ecological, and horticultural aspects of these and other native trees of economic importance are under development. This intercontinental collaboration would never have begun without the encounters and field visits catalyzed by meetings of the ERA.

The current and future impact that Middle Eastern botanic gardens offer to restoration is evident. RBGJ and OBG will provide ideal training hubs and help develop approaches and models for surrounding countries as well as migrant camps that are desperately in need of ecological restoration to improve the quality and quantity of ecosystem goods and services. Concurrently, tourism to the two new botanic gardens will allow dissemination and outreach to a broader audience. The ERA provides a framework for providing support and scaling up.

An example of a project to be demonstrated at the RBGJ is the Community-Based Rangeland Rehabilitation (CBRR) program, which was initiated as a means by which to relieve grazing pressure on the site, and allow the land to regenerate and become more productive. Because of its inception, the CBRR has successfully established a multi-faceted managed grazing program that has resulted in a marked improvement of the land and has the potential to be replicated. Not only has the CBRR regenerated the land, but has also brought benefits to the community in the form of higher incomes for local livestock owners, healthier families, more productive livestock, community mobilization, greater understanding of sustainable land management practices, and the potential for the replication
of CBRR ideas into other regions of Jordan and the Middle East (Abuamoud et al. 2013).

Restoring for the Future: Botanic Gardens Get into the Action

Botanic gardens are often home to precisely the combination of skills, vision, and resources essential to support all of the facets required to achieve effective restoration. In a situation such as the Middle East, where land degradation is widespread and capacity and resources to support restoration are limited, it is encouraging to see the development of new botanic gardens and the growing momentum for cooperation between these institutions to work together. Supported by their international partners through the ERA, they clearly have a role to play in advancing the practice and mainstreaming of science-based and livelihood-generating ecological restoration in the region.

Aguilar et al. (2015) reported on the success of active networking among ecological restoration efforts in Colombia after 60 years of armed conflict. Indeed throughout Latin America, networking for restoration is advancing rapidly, thanks to the Sociedad Ibero-Americana y del Caribe de la Restauración Ecológica (SIACRE) (Echeverría et al. 2015) and national networks in Cuba, Chile, Mexico, and Brazil. In the Middle East and many countries in Africa and central Asia, many nations are also struggling to turn the corner on decades of political instability and ethnic strife. The new links forged as part of the ERA meeting and symposium and the establishment of regional training hubs at RBGJ and OBG will be essential in driving forwards an ecological restoration agenda in the Middle East.

It is essential that ecological restoration concerns be incorporated into national policies to help governments meet their commitments to international treaties and their own development plans. As a result of the public symposium and follow up communique, the National Committee for Biological Diversity in Jordan has shown great interest in supporting science-based ecological restoration in Jordan, and for the RBGJ to serve as a hub for ecological restoration in the region.

In the developing world, and indeed everywhere, there is important need for restoration and a shortage of capacity, and centres of excellence and training. The ERA — among other new public and private initiatives — offers a ray of hope. In the Middle East, East Africa, the Americas, and elsewhere, we hope to work together as hubs, with pilot projects, training programs, and demonstration sites for ecological restoration. The regular meetings of the ERA present a platform to engage with governments and private sectors in the host regions and to influence policy and decision making. Working in close collaboration with SER, SIACRE, and other like-minded organizations around the world, the ERA aims to support and deliver science-based ecological restoration with lasting results.

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LITERATURE CITED


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