ECOLOGICAL RESTORATION: AN OASIS OF OPPORTUNITY

MENA 2018
ESP REGIONAL CONFERENCE

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Ecological restoration is...

- Inspiring
- Hopeful
- Solutions-oriented
- Proactive
- Participatory
- Ambitious
- Achievable
- Audacious
Inspiring: Jordan
Community-Based Rangeland Rehabilitation

- Royal Botanical Garden of Jordan (RBG-J) developed the program in partnership with local people.

- Successes include:
  - Dramatic increase of biomass onsite (from 40 to 150 tons/year)
  - Increase in the number of animals and amount of grazing access
  - Increased from original 5 families to 52 families
  - Plant species diversity increase from 432-622 spp

- Using this model to develop sustainable grazing protocols and to share those protocols with other herdsmen and farmers in the region.
Outline

▪ Definitions
▪ International targets and goals
▪ Restoration and ecosystem services in the MENA region
▪ Tools and Resources
Definitions
Definitions

- **Ecological or ecosystem restoration** is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. (SER Primer 2004)

- **Ecosystem Services** are the benefits that people obtain from ecosystems, generally divided into four categories (supporting, provisioning, regulating, and cultural). (Millenium Ecosystem Assessment)

- **Biodiversity** is “the variability among living organisms from all sources, including, 'inter alia', terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.” (UN Earth Summit via Wikipedia)
Definitions

- **Provisioning services**: products obtained from ecosystems, such as food, genetic resources, fiber, and energy.
- **Regulating services**: benefits obtained from the regulation of ecosystem processes, such as regulation of climate, water, and some human diseases.
- **Cultural services**: non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience.
- **Supporting services**: services that are necessary for the production of all other ecosystem services. Examples include biomass production, production of atmospheric oxygen, nutrient cycling, water cycling, and provisioning of habitat.
Definitions

- **Restorative activities** are those activities that may not necessarily be ecological restoration but which are based on the principles underpinning ecological restoration. (SER International Standards 2016)

- **Forest and landscape restoration (FLR)** is the process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes. (Global Partnership on Forest and Landscape Restoration)
Cautions

- **Ecological Restoration**
  - Robert Elliot’s “restoration thesis” that restoration allows for nature to be damaged because we can fix it later.
  - Andrew Light’s distinction between “benevolent” and “malicious” restoration.
  - Young, dynamic, and challenging science – many restoration projects fail – adaptive management is critical.

- **Ecosystem Services**
  - By definition the focus is on benefits to people, devaluing inherent values of nature as well as natural values that may not benefit people.
  - Many ecosystem services projects focus on only one or two services instead of a holistic suite of services
  - Threat of “perverse incentives” to destroy intact habitat to achieve specific ecosystem service objectives.
International Targets

DRIVERS OF ECOLOGICAL RESTORATION AND ECOSYSTEM SERVICES OBJECTIVES
Targets and goals

- Sustainable Development Goals

- Bonn Challenge/New York Declaration on Forests
  - Restore 150 million hectares of degraded land by 2020
  - Restore 350 million hectares of degraded land by 2030
    - Initiative 20/20
    - AFR 100

- Aichi Biodiversity Target 15
  - All signers to the Convention on Biological Diversity to restore 15% of their degraded lands by 2020

- Paris Climate Summit
  - Limit global temperature rise to 1.5-2.0°C
  - At least US$100 Billion/year for adaptation and mitigation.
Targets and goals

AFR100 (the African Forest Landscape Restoration Initiative) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. AFR100 contributes to the Bonn Challenge, the African Resilient Landscapes Initiative (ARLI), the African Union Agenda 2063, the Sustainable Development Goals and other targets.

Follow #AFR100

COMMITMENT TRACKER

81% COMPLETE

SDGs
Achievable: Brazil

Itaipu Dam

- 60,000 hectares of forest planted in a 100m strip along 1,500 km of reservoir.
- Purpose to achieve a variety of ecosystem services and mitigate dam construction.
- On way to 5 star recovery via planting and natural regeneration.

15 months after planting

30 years after planting

Google earth view of reforestation
Achievable(?): China Grain for Green Program

- Started in 1999
- Focus is on specific ecosystem services of flood control and erosion control, as well as reforestation for timber, tree fruits and other cash crops
- Considered largest or one of the largest reforestation programs in the world
- Re-established 27.8 million hectares of forest through 2013
- Majority of projects (82%) are monocultures with little biodiversity
- Projects result in significant loss of biodiversity for bees and birds
- Grain for Green can be improved with native multi-species reforestation efforts

Hua et al. 2016. Opportunities for biodiversity gains under the world’s largest reforestation programme. *Nature Communications*. 7:12717
Integrating ER and ES

Key Benefits
- Delivery of holistic outcomes that provide a wide variety of ecosystem services as well as biodiversity.
- Restoration is THE tool for ensuring we can meet the challenge of climate change.
- Restoration that enhances/restores biophysical properties delivers ecosystem services.
- Projects that integrate a large scope of ecosystem services are more likely to benefit from ecological restoration.
- Restoration that delivers ecosystem services is more likely to improve local socio-economic conditions.

Key Challenges
- Emphasis on single ecosystem services (e.g. carbon, grazing), can result in adverse ecological impacts.
- Many ES projects do not focus on biodiversity, many ER projects do.
ER and ES in the MENA region
MENA survey – initial results

- Responses from 9 countries within the MENA region

- Top 3 restoration objectives
  - Sustainable land use to improve local socio-economic conditions
  - Improving biodiversity
  - Combatting desertification

- Top 3 restoration challenges
  - Lack of funding
  - Lack of skills, knowledge, workforce training
  - Lack of appropriate plant materials/nurseries

- Top 3 knowledge or practical gaps that need to be filled
  - Investment in restoration science (applied research and monitoring)
  - Improving communication between researchers, practitioners, and stakeholders
  - Standards and best practices to guide the design and implementation of projects
Restoration Challenges

- Lack of funding
- Lack of skills, knowledge, training
- Lack of plant materials/nurseries
- Political climate
- Land tenure
- Humanitarian Crises

The bar chart shows the distribution of challenges, with Lack of funding being the most significant.
Restoration objectives

- Combating desertification
- Restoring freshwater sources
- Increasing biodiversity
- Delivering ecosystem services
- Achieving international climate/carbon targets
- Achieving other targets
- Sustainable land use to improve local communities
- Other
Key Needs

- Investment in restoration science
- Knowledge & examples of restoration in arid lands
- National/International research mentorship
- Researcher/practitioner/stakeholder communication
- Standards & best practices for restoration
- Models about restoration for ecosystem services delivery
- Lack of landscape scale planning/strategy
- Knowledge & examples to restore in context of climate change
- Other
Proactive: Lebanon
Lebanon Reforestation Initiative

- Multi-faceted restoration and ecosystem services project in Anjar, Lebanon, led by the Lebanon Reforestation Initiative.

- Key components and successes:
  - Planted 45,940 seedlings on 45.2 ha of public lands in Anjar province
  - Partnership with a local car rental company to plant trees as carbon offsets
  - Support and promotion of local businesses, restaurants, apple orchards, trout farms and other local agricultural businesses
  - Development of a fire fighting program, including procuring a new fire truck, to suppress fires to protect planted areas
  - Partnership with Society for the Protection of Nature in Lebanon and Great Escape (local tour operator) to develop and implement an ecotourism program that includes introducing people to Important Bird Areas, migratory bird issues, etc.
  - Proposal to create biking trails and additional outdoor opportunities
  - Training and employment through tree planting, tree pruning, and other reforestation management
  - Development of a story map with images, videos, and explanation of this comprehensive community-based program

All information from: [http://www.lri-lb.org](http://www.lri-lb.org) (interactive map/story mapping section)
Resources and Tools
International Standards for the Practice of ER

- Released as a living document in December 2016
- Applicable in all types of ecosystems and across all sectors

Core sections include:
  - Introduction
    - Underpinning principles
    - Reference ecosystems
  - Six key concepts
    - Recovery wheel and 5-star ratings system
  - Standard practices for planning and implementation
  - Restoration and the big picture
    - Restorative continuum
  - Glossary and appendices

- Available in multiple languages, including Arabic, with many thanks to the Kuwait Institute for Scientific Research

ser.org/standards
Section II: Recovery Wheel

Hypothetical project on target for 4 star recovery
The Restorative Continuum

RESTORATIVE ACTIVITIES
(Reducing casual problems and improving ecosystem function complementary to restoration)

ECOLOGICAL RESTORATION
(Aiming for highest level of recovery possible relative to appropriate local native reference ecosystem)

- Causes of decline reduced
- Ecosystem function improved
- Native habitats enhanced
- 1-2 star native recovery
- 3-4 star native recovery
- 5 star native recovery

In permanently modified land and waterfall areas
At interface between modified and natural areas
At any location or scale in modified or natural systems

INCREASING SIMILARITY TO LOCAL NATIVE REFERENCE ECOSYSTEM
Additional Resources

- Restoration Resource Center
  - Launched in February 2018
  - Projects database (more than 250 projects to date)
  - Resources database (more than 2,000 resources to date)
  - Wiki/crowd-sourced and seeking submissions
  - Searchable and open to anyone interested in learning more about and or sharing new restoration tools and resources

- Restoration Ecology journal

- Restoration Ecology: Arid Lands subjournal
  - To be launched in 2018, many thanks to partnership with Kuwait Institute for Scientific Research (KISR)

- Certified Ecological Restoration Practitioner (CERP) program

- Webinar series
Hopeful: Kuwait post-conflict restoration


- Restoration across 1,680 sq km of protected areas (revegetation on 79.2 sq km), using:
  - 3,000 kg of native seeds
  - 24 m seedlings
  - 699,000 trees

- Project occurred over 8 years, revegetated 79.2 sq km.

- KISR developed a methodology for scaling up the production of Arfaj (*Rhanterium epapposum* Oliv), the national plant of Kuwait, to maintain cultural heritage, ecological integrity, wildlife habitat and sustainability, while also providing jobs and creating recreational opportunities.

- Partnered with several other institutes to develop a model to assess biodiversity benefits as well.

All information from Asem and Kaitharath 2014 (*presentation at CEER conference*).
Audacious: African continent
Great Green Wall

- Fertile land
- Food security
- Green jobs
- Security
- Peace
- Resilience to climate change

http://www.greatgreenwall.org/great-green-wall
Ecological restoration delivers

- Biodiversity

- Ecosystem services
  - Vegetation for grazing
  - Vegetation for water storage
  - Water
  - Carbon
  - Jobs and community sustainability
  - Recreation

- Integrated landscape recovery opportunities at scale

- Hope and opportunity, especially when we partner beyond borders, even in difficult political and environmental climates

John Liu photos
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- Survey respondents
THANK YOU

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