Session's Report Template - Draft

Title of the Session:	**A Comprehensive Approach to Mangroves and Wetlands Development**
Chair:	Olof Linden
First Panelist	Olof Linden
Introduction of the Session's topic:	Title of presentation: Mangrove rehabilitation in the Niger Delta - Approximately 1,500 ha of mangroves killed due to oil spills are presently being restored in Ogoniland, an area southeast of Port Harcourt; - The techniques used involve cleaning of contaminated sediment using high pressure seawater flushed through the sediment from about 1 m below the sediment surface. Free oil is collected using booms; - About 1,5 million plants (several species) have been planted so far; - Survival rates are on average 75%, monitoring and replanting are carried out after 6 month, 2 years and 5 years; - The methods used have been published in several reports, see for example: Gundlach, E.R., Bonte, M., Story, N.I. and Iroakasi, O. (2022). Using high-resolution imagery from 2013 and 2020 to establish baseline vegetation in oil-damaged mangrove habitat prior to large-scale post-remediation planting in Bodo, Eastern Niger Delta, Nigeria. *Remote Sensing Applications: Society and Environment* 28 (2022) 100831. https://doi.org/10.1016/j.rsase.2022.100831

Panelist:	Anna Grichting
Title of the presentation:	Wadis and Wetlands. Co-creating Regenerative Blue Landscapes in Drylands.
Outline/ Issues addressed:	Presentation of The Landscape Urbanism approach, which centers urban development and regeneration on Productive Landscapes, Water Management and Biodiversity Conservation and fosters a participative approach to planning and a symbiosis with nature and all species. Examples in the Gulf region of Wadi remediation projects, constructed wetland and Urban Forestry projects using TSE, and the importance of working with water engineers and environmental experts in urban design. Developing integrated coastal management at the interface of land and sea, and addressing future climate threats, sea level rise, storm water management, etc. Using and reusing all types of water, and exploring the use of sea water and halophytes to reduce desalination.
Key-Takeaways:	Blue Design – the importance of water management in urban design. Regenerative urbanism, which repairs, remediates and restores our urban areas and ecosystems. Wadis and Wetlands as ecological infrastructure – soft engineering to replace hard engineering. A multi-stakeholder approach to design and management of urban landscapes.

Panelist:	Badar Al Busaidi
Title of the presentation:	Mangrove Project in Oman
Outline/ Issues addressed:	Ramsar Sites in Oman: 2 registered and 1 in the process of registration; There are 9 mangrove forests in Oman. Only one species: Avicennia marina; Four mangrove nurseries are operated in Oman. Tidal water are used; Seeds of Avicennia are collected and washed for 6 hrs before being planted; Germination after 14 days; The method of planting was described, so far 32 sites have been planted; 766,000 trees over 800 ha have been planted. Trees have grown up to 9m; Grazing (camels and goats), insect attacks, and litter cause problems Information campaigns are conducted to raise awareness

Key-Takeaways:	Methods for mangrove restoration in Oman have been developed and significant areas have already been replanted

Panelist:	Dr.Rahma Al Nadhairi
Title of the presentation:	Green Environment Ideas
Outline/ Issues addressed:	Environment Authority in Oman is responsible for the protection of the environment by applying laws and regulations and developing research programs exchanging experiences, and collecting environmental data. The Authority is also in charge of combatting pollution and preserve the ecosystems. Furthermore, the authority is responsible for spreading awareness and establishing the principles of preserving the environment and its resources.
Key-Takeaways:	Mangrove ecosystems in Oman is affected by the changing climate, in particular the changing cyclone pattern in the Arabian Sea. Also, the upwelling of oxygen limited waters is of concern as well as increasing problems with coastal erosion and coral bleaching.

Panelist:	Francois De Keuleneer
Title of the presentation:	A Vision for Oman Wetland Development
Outline/ Issues addressed:	In order to find sites suitable for development of wetlands/mangroves, about 10 sites (wadies) were studied and two identified as suitable based on inlet stability, topography, soil fertility and freshwater availability and using a 3-d hydrodynamic model. Based on the modelling about 30% of the coastal lagoon to be created would be hosting mangrove vegetation, 32% would become intertidal mudflats, the shallower areas will become marshlands and deeper areas will be suitable to host seagrass meadows. Plans were presented for the technical aspects of the work.
Key-Takeaways:	The preliminary study shows: - Feasible to develop large coastal areas suitable for mangrove growth - Optimal result achieved when fully functional coastal lagoons are developed - There are multiple potential locations - A thorough feasibility study is a logical next step - A Public Private Partnership (PPP) shall be created - Such PPP would qualify to attract very competitive green financing

Panelist:	Wafa Al Maamaris
Title of the presentation:	Planting in Oman with Water Saving Technology
Outline/ Issues addressed:	Experimental use of a water saving technology ("Waterboxx") in sites in Oman (Mirbat). The experiments showed: The technology protects the seedling, saves water and makes it possible to plant in dry regions such as in Oman. The Waterboxx makes the root structure develop naturally, rather than stay near the surface. Furthermore there is less need of pesticides. Only 50 ml of water is channeled from the reservoir per day with the help of a wick. This is enough for the plant to stay strong and seek out water deep down. The technique makes the tree independent, and after 6-18 months the Waterboxx can be removed and reused.
Key-Takeaways:	Techniques are available to enable trees to grow in the dry areas in Oman

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Issues raised during discussions with audience	A lot of discussion focused on the presentations related to restoring mangroves in lagoons on the Omani coast, as well as on the tree-planting technology. The experiences from Qatar regarding greening of urban areas were also discussed as well as techniques for mangrove plantations in contaminated sites. There was also a discussion on the topic of what is a “tree plantation” and is this really restoration of an ecosystem.
Conclusions of the session	With better technology, “greening” of dry landscapes as those in Oman is possible; Attempts should be made to restore ecosystems, not just single species of trees.