BOOK OF ABSTRACTS

This Book of Abstracts provides a comprehensive overview of the session content and is structured into three main sections:

I. Session Description – an introduction to each session, including its objectives and expected outputs
II. Session Program – a detailed schedule for each session, including speakers and timing
III. List of Abstracts – a complete compilation of all accepted abstracts

I. SESSION DESCRIPTION

ID: S9a

Developing ground-up Nature-based Solutions in collaboration with IPLCs

Hosts:

	Name	Organisation	E-mail
Host (s):	Kamaljit K Sangha	Charles Darwin University	kamaljit.sangha@cdu.edu.au

Abstract:
This session will focus on developing Nature-based Solutions (Nbs) from ground-up, working collaboratively with Indigenous Peoples' and Local Communities. This will include designing various incentivising mechanisms (e.g. Payment for Ecosystem Services), policy structures, and respecting and incorporating community values and perspectives. The idea is to share key lessons and challenges from ground-up case studies across the globe, so we can develop a shared understanding of what is required to deliver effective and efficient NbS that help to achieve IPLCs' well-being/livelihoods as well as conservation outcomes. The main topics could include:

1. Case studies of NbS
2. Policy structures and support required for NbS
3. IPLCs' perspectives and values in relation to NbS
4. Various incentivising mechanisms to support Nature-positive futures
5. Challenges and opportunities for developing and implementing NbS from the IPLCs perspectives

Goals and objectives of the session:
To develop a shared understanding of challenges and opportunities to design effective and efficient NbS/Nature-based Economies or incentivised mechanisms.

Planned output / Deliverables:
A compilation of different case studies with key lessons.
A paper publication on key lessons to inform future NbS/NbE

Session format:
Normal Presentation for session presenters (8-10), followed by discussion with the audience.

Related to ESP Working Group:
SWG 9 – Indigenous people & Local communities

II. SESSION PROGRAM

Room: Lounge

Session host: Prof Kamaljit K Sangha, Charles Darwin University, Australia
Date of session: Friday 22, May 2026

Time of session: **09:00 – 10:30 (90 mins)**

Timetable speakers:

Time	First name	Surname	Organization	Title of presentation
09:00-09:05	Kamaljit K.	Sangha	Charles Darwin University, Australia	Introduction of the session and speakers
09:05 – 09:15	Kamaljit K.	Sangha	Charles Darwin University, Australia	Culturally appropriate nature-based solutions policy settings supporting Indigenous Peoples in Australia—International lessons and applications
09:20 – 09:30	Mattias	Gaglio	University of Ferrara, Italy	A Framework for Assessing the Multiple Environmental Benefits of Urban Reforestation: A Case Study in Ferrara (Italy)
09:35 – 09:45	Ruchi	Badola	Wildlife Institute of India, Dehradun, India	Understanding social-ecological interactions in a human-dominated riverscape: Evidence from participatory mapping along the Yamuna River
09:50 –10:00	Zhichao	Xue		Nature-based tourism in pastoral areas: bottom-up insights from an ecological gradient grassland zone
10:05 – 10:15	Daniela	Alba-Patiño	University of Almeria, Spain	The Role of Culturally Important Plant Species in Sustaining Ecosystem Services and Rural Well-Being
10:20 – 10:30				Discussion

III. LIST OF ABSTRACTS

The first author is the presenting author unless indicated otherwise

1. Culturally appropriate nature-based solutions policy settings supporting Indigenous Peoples in Australia—International lessons and applications

***First author*:** Kamaljit K Sangha
***Affiliation*:** Charles Darwin University, Australia
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Nature-based Solutions (NbS) are fast emerging as action-based approaches to address climate change, biodiversity decline, land degradation, conservation and socio-economic issues. Among a wide range of NbS approaches, Payment for Ecosystem Services (PES) is one of the famous and tried approaches that have been developed and implemented in several countries to date, offering lessons to be learnt for developing innovative NbS-PES 'systems' _which are beyond the typical market approach and related policy settings, particularly to benefit Indigenous perspectives. To develop such Indigenous-specific PES

or more appropriately incentivising schemes for Indigenous Peoples and Local Communities (IPLCs), we analyse and draw lessons from three famous PES schemes from Costa Rica, Mexico, and the Biodiversity Conservation Trust (BCT) from New South Wales (NSW), Australia. We examine their operational policy infrastructure and mechanisms for governing, monitoring, and payments/incentives for Ecosystem Services (ES). One common feature of the selected schemes is the pivotal role of national (Costa Rica and Mexico) and state (NSW) governments in developing specific legislation and regulatory guidelines to mediate these programmes, establish a national/state fund and authority to monitor the contracted conservation sites—offering a standardised and credible arrangement for ES providers and beneficiaries while reducing transactional costs for all parties. Other key learnings include applying a simple, input-based approach and paying land managers on a per-hectare basis for ES as a bundle, using simple indicators such as the state of the forest/ecosystem as a proxy for ES—offering insights for developing nature-based markets for Indigenous peoples in Australia and IPLCs globally. While planning Indigenous-specific schemes, we emphasise that it is critical to consider sociocultural and economic settings in which locals operate to develop equitable and sustainable mechanisms, given that many IPLCs' _value systems are societal and their relationships with nature often lie outside the typical market regimes. Applying IPLCs' _perspectives, we explore a Common Assets Trust model at a state/national scale as an alternative to the market approaches that can afford a common platform for stakeholders to exchange, govern, and monitor ES while also promoting the development of equitable, sustainable, and culturally appropriate incentivizing mechanisms involving low transactional and monitoring costs for IPLCs globally.

Keywords: Indigenous peoples, local communities, nature-based solutions, Sustainable development, nature-based economies

2. A Framework for Assessing the Multiple Environmental Benefits of Urban Reforestation: A Case Study in Ferrara (Italy)

First author: Mattias Gaglio
Other author(s): Vittoria Fornasier, Piergiorgio Cipriano, Marika Ciliberti, Luciano Bosso, Silvano Fares, Giuseppe Castaldelli
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Urban reforestation is a key nature-based solution (NbS) for enhancing ecosystem services in cities, supporting environmental quality, human well-being and biodiversity. Quantifying ecosystem condition and service provision is essential to integrate natural capital into urban planning. This study evaluates the environmental impacts of an urban reforestation project in Ferrara (Italy) comparing pre- and post-reforestation conditions within a 1 km buffer across three dimensions: air quality regulation, urban accessibility to green spaces and landscape connectivity, and proposes a replicable framework for similar interventions.
Air purification services were estimated using the AIRTREE model, providing spatially explicit contributions to urban air quality. GIS-based analyses of the popular rule 3-30-300 assessed effects on environmental indicators linked to human exposure and well-being. Connectivity with surrounding green areas was quantified using Fragstats software to evaluate potential benefits for urban biodiversity.
Despite the relatively small size of the intervention, the framework underline the significant contribution of the project, providing the quantification of multiple tangible benefits: increased air purification capacity, enhanced accessibility and recreational benefits for residents, and strengthened connectivity among green spaces supporting biodiversity conservation. The approach integrates modelling and spatial analyses into a structured, multi-dimensional framework that can be applied to other urban contexts, linking ecosystem service provision to environmental, social and ecological outcomes, and supporting evidence-based NBS implementation under the ecosystem accounting approach.

Keywords: Urban reforestation, Nature-based solutions, Air quality regulation, 3-30-300 rule, Landscape connectivity

3. Understanding social-ecological interactions in a human-dominated riverscape: Evidence from participatory mapping along the Yamuna River

First author: Amanat Kaur Gill

***Other author(s)*:** Amanat Kaur Gill, Mohit Payal, Piyush Kumar Anuj, Pariva Dobriyal, Kamaljit Sangha, Syed Ainul Hussain, Ruchi Badola
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Ecosystem services (ES) assessments of large river systems frequently prioritize biophysical indicators and market centric values, often leading to the systematic underrepresentation of locally embedded, cultural, and relational services, particularly in highly modified and polluted riverscapes. This study addresses these gaps through a participatory ecosystem services assessment of the Yamuna Riverscape, generating village-level extent and trend data to make visible ecosystem services and disservices that are typically overlooked in centralized riverscape governance and valuation frameworks. The study spans 18 villages along the Yamuna, from its Himalayan headwaters to its confluence with the Ganga, covering rural mountain settlements, intensively abstracted agricultural zones and urban-industrial corridors. This longitudinal design enables systematic comparison of ecosystem service dynamics across gradients of urbanization. Data were collected through participatory mapping exercises. The community groups identified locally relevant ecosystem services and disservices in a Google Earth map of the village. Services were classified into provisioning (irrigation, drinking water, biotic and non-biotic resources), regulation and maintenance (soil fertility, biodiversity, waste management), cultural (religious, recreation, aesthetics), and disservices (flooding, loss of access). Results reveal a pronounced longitudinal gradient in ecosystem services. Upper reaches exhibit relatively high and stable provisioning and cultural services, while the agriculture-intensive and urban middle stretch shows sharp declines in provisioning and regulating services alongside increasing disservices linked to water abstraction, sand mining, urban and industrial pollution. Despite severe ecological degradation, cultural ecosystem services retain high relative extent in urban and peri-urban contexts. In the lower reaches, partial ecological recovery corresponds with improving trends in several provisioning services, alongside emerging pressures from sand mining was observed. The study demonstrates that participatory ES extent-trend data can generate spatially explicit, comparable indicators while capturing underrepresented cultural and relational values, supporting more decentralized and context-sensitive river governance in highly transformed socio-ecological systems.

***Keywords*:** Participatory mapping, Ecosystem services, Ecosystem disservices, Relational values, River governance

4. Nature-based tourism in pastoral areas: bottom-up insights from an ecological gradient grassland zone

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The conflict between herders' well-being and grassland conservation is intensifying due to growing demands for livestock production and warming and drying trends associated with climate change. Nature-based tourism is a burgeoning way that has huge potential for sustainable development and economic growth in pastoral areas. However, realizing this potential requires strong operational partnerships and effective coordination among governments, tourists, and herder communities to identify, avoid, and minimize social and ecological risks and to achieve lasting development outcomes. By integrating remote sensing data, questionnaires surveys of herders and tourists, and expert interviews, this study assesses the impact of tourism development on pastoral social-ecological systems in the Mongolia plateau's ecological gradient zone. The main findings are as follows: (1) Nature-based tourism diversifies herder household incomes and shows significant growth potential with the development of digital platforms; however, limited role self-efficacy among herders may constrain further development. (2) Herder–tourist interactions play a distinctive role in grassland tourism, as grasslands simultaneously serve as the economic foundation for herders and as core attractions for tourists, making the relationship central to sustainable tourism management. (3) From an ecosystem services cognition perspective, tourists place greater emphasis on sociocultural and economic benefits, whereas herders focus more on ecological and environmental impacts, with herders' attitudes further differentiated by spatial location and level of involvement in tourism. This case study offers practical insights for designing rational nature-based

tourism in remote pastoral regions facing acute human-environment tensions and increasing climate change pressures.

***Keywords*:** grassland tourism; socio-ecological system; ecosystem services; multi-stakeholders' participatory

5. The Role of Culturally Important Plant Species in Sustaining Ecosystem Services and Rural Well-Being

***First author*:** Daniela Alba-Patiño
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Integrating Local Ecological Knowledge (LEK) into biodiversity conservation is increasingly recognized as essential for sustaining ecosystems and human well-being. Species that provide culturally significant functions vary across regions and cultures; however, those most closely linked to Indigenous and local communities are generally the species on which people depend for food, medicine, materials, fuel, and vital needs. These species are deeply embedded in cultural traditions, narratives, ceremonies, language, and everyday practices, and play a role in the transmission of Traditional Ecological Knowledge (TEK). Culturally important species (CIS) are defined as species that hold high significance for local people due to their functional roles in subsistence, material use, cultural identity, and/or spiritual values. The decline of CIS can negatively affect the human livelihoods, the intergenerational transmission of TEK and the provision of associated ecosystem services.
In this study, we explored locals' preferences for seven culturally important plant species—Salvia rosmarinus (rosemary), Thymus spp. (thyme), Foeniculum vulgare (fennel), Atropa belladonna (belladonna), Retama spp., Juniperus spp. (juniper), and Macrochloa tenacissima (esparto)—and used their LEK to identify the main ecosystem services provided by these species and their contribution to human well-being. We conducted in-depth interviews with 25 locals strongly connected to the territory in the Vélez region (Almería, southern Spain).

Interviewees identified a wide range of ecosystem services, including food provision, natural medicines, raw materials, biological pest regulation, identity values, spiritual and religious values, language and ethnobotanical knowledge, LEK transmission, and aesthetic and landscape values. Thyme, rosemary, and esparto were the most frequently mentioned species and major service providers, whereas juniper emerged as the most culturally important overall. Belladonna was associated with the fewest services. Our findings highlight the critical role of culturally important species in sustaining ecosystem services and human well-being and emphasize the value of integrating LEK into conservation and ecosystem management strategies.

***Keywords*:** Local Ecological Knowledge, social preferences, plant species, rural areas