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**ABSTRACT BOOK**

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adaptation (CCA). In the context of DRR, ecosystems contribute to hazard mitigation as well as to the reduction of the so called "underlying risk" as outlined in the Hyogo Framework of Action (HFA, 2005). Although engineered structures are still preferred and promoted by planning authorities dealing with disaster risk reduction in many cases, there is an increasing number of applications of ecosystem based solutions in disaster risk reduction worldwide. Similarly ecosystem based adaptation (EbA) measures in CCA are gaining recognition. Examples of such measures are wave dampening by willow or mangrove forests, functional green infrastructure in urban areas or sustainable land management in drylands. The ESP working group on Ecosystem Services and Disaster Risk reduction aims to integrate the concept of ecosystem services into DRR and CCA and provides a platform for research investigating the potential of ecosystem-based approaches for Disaster Risk Reduction (DRR). After discussing relevant concepts and identifying potential synergies, this presentation will showcase a number of applications in a range of contexts based on the existing research activities within the working group. For some selected cases, the role of ecosystem services and how they contribute to reducing risks and vulnerabilities and/or contribute to climate change adaptation will be presented. The presentation will also highlight linkages to other ESP working groups that provide solutions for disaster risk reduction from specific ecosystems perspective, such as for fresh water and marine environments.

## O-2220-02

### A Community Forestry-landscape based approach to climate change adaptation

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International debate on the role of forests in climate change has thus far mainly focused on their potential to mitigate Greenhouse Gas emissions (GHGs), particularly through the REDD+ mechanism. However, the role of forests in contributing to climate change adaptation has been gaining recognition. In addition to the efficiencies in linking adaptation and mitigation funding and project activities, a key rationale for focusing on forest landscapes for adaptation is the reliance of approximately 450 million people on forests in the Asia Pacific region alone. The contributions of forests to the livelihoods of these local communities is significantly higher than previously thought and thus a major contributor to their adaptive capacity. Conversely, local communities may prove to be critical in on the ground implementation of activities to support ecosystem resilience. Community forestry (CF) in this context is of particular importance as a modality for providing multiple benefits to local communities, and the various assets required for adaptive capacity in a context of climate change. The focus of this research article is to present a CF based climate change adaptation framework, which is grounded in 10 case studies in Cambodia, Indonesia, Nepal, Thailand, and Vietnam, and the recent piloting of this framework in the Terai of Nepal.

## 2220-POSTER PRESENTATIONS

### P-2220-01

#### Ecosystem services as determinants of social-ecological system transformations: Dojran Lake, Macedonia

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Global environmental change often triggers abrupt and irreversible ecosystem shifts resulting in transformations of social-ecological systems. The capacity to adapt to such variable and uncertain conditions is a unique learning opportunity to better understand factors underpinning system's resilience to shocks. This study examines a social-ecological system through the lens of ecosystem services and their role as determinants of a transformation.

The project Integrated Water Resource Management (IWRM) at Dojran lake in Macedonia applied the ecosystem services' framework to examine the impacts of sudden natural disasters affecting Dojran Lake in Macedonia. Once a significant site in the Balkan peninsula, known for its water health benefits, fisheries, and abundant hydrological resources for agriculture and surrounding settlements, the lake has experienced two extreme shocks resulting in flood (1955 – 1956) and drought (1989). The shocks were detrimental for the small, mesotrophic –eutrophic lake of 42.5 km<sup>2</sup> and with the maximum depth of 10 m. The research is focused on the latter, anthropologically driven, event, which lead to a 60 cm drop in water level of the lake, a recession of lake's margins up to 100 m from the main settlement, the disappearance of much of the western littoral zone, and significant biodiversity loss. All these resulted in long-term impacts on the social-ecological system and overall economic downturn associated with collapse of the local fisheries industry and decreased tourism.

In the attempt to better understand how did the abrupt transformation affect ecosystem services and human wellbeing, we collected and analysed information through the following activities:

1. identification of main stakeholders at Dojran lake and analysis of their relevant role in the process of transformation;
2. analysis of social, ecological, and economic factors defining the current state of the system;
3. identification and prioritization of ecosystem services and their current conditions;
4. exploration of the stakeholders' visions about desired future social-ecological pathways and consultation of the development strategies of the local government.

The collected information contributed to the development of a holistic picture of the actors and components necessary to understand the resilience of the system, emphasizing the dynamic character of the internal transformation processes.

The research was further guided by the principal question of how the listed information can provide insights for the management and conservation of the altered social-ecological system. Results show that the state of ecosystem services provision has dramatically decreased; nevertheless they continue to be determinant for local communities' wellbeing and an indicator for their adaptive capacity. We identified recreational services, fisheries and agricultural production as the key ecosystem services. Their intensified exploitation, however, is guided by past livelihood patterns, which can hardly be supported by the current state of the ecosystem and which can be exposed to further risks in the perspective of climatic changes. Although the visions about the prospects of development in the area were rather heterogeneous, there is a common shared awareness of the need to preserve and valorize key ecosystem services.

The analysis of past sudden social-ecological transitions through an ecosystem services approach provides a comprehensive framework for the research of adaptive and coping capacities inherent in the system and the identification of its main vulnerabilities. These results represent a step forward towards identifying enabling factors to incorporate ecosystem services in the development process of the area, while strengthening the capacities for adaptive management of social and ecological systems in view of possible future shocks.

### P-2220-02

#### Impacts of land cover changes on ecosystem service delivery using remote sensing, GIS and social innovation tools at Duiwenhoks catchment

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Historic spatial land cover databases consisting of maps and land use patterns are important tools for monitoring impacts of land cover change. Such a database was constructed for Duiwenhoks catchment in the Western