

Rapid ecosystem services assessment & conceptualization of conservation effectiveness in Pendjari Biosphere Reserve, Benin

Goad Devonne^{1,2,3,4}

¹ University of Gent, Department of Biology, Research group Marine Biology, Campus Sterre, Krijgslaan 281/S8, 9000 Ghent, Belgium
E-mail: dv980169@dal.ca

² Vrije Universiteit Brussel (VUB), Ecology and Biodiversity, Marine Biology, Pleinlaan 2, 1050 Brussels, Belgium

³ Royal Belgian Institute of Natural Sciences (RBINS), Rue Vautier 29, 1000 Bruxelles, Belgium

⁴ Université D'Abomey-Calavi, Laboratoire de Biomathématiques et d'Estimations Forestières (LABEF), Calavi, Abomey Calavi, Benin

Despite increasing public awareness and inclusion into both academic and policy spheres, natural ecosystems and the services they provide are under intense and widespread pressure. Humans have dramatically altered ecosystems worldwide, hindering the ability of these systems to deliver provisioning, regulating, supporting and cultural services. The Millennium Ecosystem Assessment (2005) found that over 60% of ecosystems are either degraded or transformed, resulting in substantial economic growth for some and the exacerbation of poverty for others. While all humans depend on the four of ecosystem services for their livelihood and well-being, it is understood that rural people living in developing areas have a greater reliance on natural resources and are therefore more susceptible to negative impacts associated with transformation and degradation. In 2015, the United Nations released a set of 17 Sustainable Development Goals which aim to alleviate poverty and safeguard human well-being for the world's poorest while protect the environment and the essential services it delivers.

The Pendjari Biosphere Reserve (PBR) lies in extreme north-western Benin, was designated as a UNESCO Man and the biosphere reserve in 1986. The Biosphere Reserve and is of great ecological, scientific and cultural importance but is not immune to the global trend of ecosystem degradation and transformation; 37.4% of the population lives below the poverty line but those living near the national park are among the poorest in the country. The economy is agrarian-based, mainly sustenance-based, and the growing population (2.8%/year) drives the conversion of grassland into agricultural fields. Understanding the threats and temporal trends of ecosystem services in the PBR is essential for the sustainable management of natural resources.

This study examines the threats to and temporal trends of ecosystem services in the Pendjari National Park through use of the Nominal Group Technique (NGT). Additional objectives of this study include an assessment of changes following a recent management shift (2017) and an assessment of the utility of the NGT as a tool in conservation. The NGT is a focus group variation that consists of individual brainstorming following by group discussion and ranking, yielding both qualitative and quantitative results. Each group exercise thus consisted of three parts: identification of threats, trends and changes to management following the privatization of the park. Results were coded according to the "drivers, pressures, states, impacts and responses" (DPSIR) cause-effect chain framework developed by the European Environment Agency (EEA) to describe complex interactions between society and the environment.

Keywords: Natural resource management nominal group technique; Ecosystem services; Nominal group technique; DPSIR