



'OCEANS AND LAKES'

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Rapid ecosystem service assessment & conceptualization of conservation effectiveness in Pendjari National Park, Benin



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Cover Page Figure Captions

The village of Tanguiéta as seen between two Baobab trees from mid-height of the Atacora mountain chain (left). A woman from Tchanwassage stands in her rice fields, the termite mounds destroying patches of her field in the foreground (right).

Source © Devonne Goad.

ABSTRACT

The Pendjari Biosphere Reserve in Benin is of great ecological, scientific and cultural importance, but is not immune to the global trend of biodiversity loss and ecosystem degradation. This study examines the threats to and trends of ecosystem service provision according to local communities living around the Pendjari Biosphere Reserve through use of a TESSA (Tool-kit for Ecosystem Service Site Assessment) inspired NGT (Nominal Group Technique). The study also assesses the perceptions of local communities regarding the recent management shift which occurred in mid-2017, when *African Parks Network* (APN) assumed management of the previously state-run Pendjari Biosphere Reserve under a 10-year private-public partnership concession. The application of the TESSA-NGT method generated locally relevant data on ecosystem services in the Pendjari, which can serve to improve the sustainable management of natural resources. The method, however, proved difficult with respect to organizing focus groups in advance and accessing participants with higher levels of education.

The results of this study provide a snap-shot of the perceptions of local communities on the threats to ecosystem services and the changes following the recent management shift. The results indicate that *Land Tenure Security* and the *Strict Enforcement of Rules & Loss of Extractive Access* are the most important responses according to the demographic interviewed. The results also indicate that the rapid (8 month) management shift from a state-run agency to APN appears to have eroded what trust was built following the recent two decades of successful participatory management. Examination of trends of ecosystem service provision indicate that local communities perceive that service provision has declined with respect to all services presented, except tourism and ecological education. This is due to increases in logistic, technological and financial capacity since the management shift. A Bray-Curtis dissimilarity matrix was created to represent average heterogeneity of TESSA-NGT rank importance response data. Non-parametric permutational analysis of variance (perMANOVA) models were fit to this matrix to assess whether socio-demographic characteristics had a significant effect in determining focus group responses. The results indicate that participant municipality and gender had a significant effect in determining how local communities perceive threats to ecosystem services and changes in management. Gender and district specific approaches to resource use and management should therefore be a focal point of management schemes as the differential experiences of those of different genders and municipalities yield different understandings and knowledge of the Pendjari ecosystem and its associated threats. The data collection methods and analyses described in this study are recommended to others studying protected areas as similar studies can reduce the paucity of local and traditional ecological knowledge in decision-making and policy.

Key words: Natural resource management, ecosystem services, nominal group technique, Tool-Kit for Rapid Ecosystem Service Site-Based Assessment, Pendjari Biosphere Reserve, Benin.