

3<sup>rd</sup> World Congress and Expo on

# GREEN ENERGY

September 28-29, 2017 Berlin, Germany

## The green economy and landscape restoration: Economics of controlling bush encroachment and invasive plant species in South Africa

**William H L Stafford**

Natural Resources and Environment - CSIR, South Africa

Bush encroachment and alien plant invasions alter the composition and/or balance of species in natural ecosystems and impact biodiversity, land productivity and water availability. While progress has been made in restoration programmes, relatively little cost recovery has been achieved in the form of payment for ecosystem services restored, nor from the value adding opportunities of using woody biomass for timber products, wood fuels and electricity. This paper estimates the value of the benefits from key ecosystem services (water availability, grazing capacity, carbon, timber, wood fuels and electricity) that are provided through the appropriate management of bush encroachment and invasive alien plants in South Africa. The value of ecosystem services from the restoration of bush encroachment was estimated to be US\$2.1 billion, while the value of ecosystem services from the restoration of alien plant invasions was estimated to be US\$6.6 billion. The most valued ecosystem service benefit assessed was electricity, followed by water, wood-fuels and then grazing and timber products. The value of these ecosystem services are considerable compared to the direct costs involved to clear invasive alien plants and control bush encroachment. For example, using bush encroachment and alien plant biomass for electricity generation could provide 3.6% of South Africa's electricity with a value of US\$ 3.7 billion, as well as reducing carbon emissions by 133 million tCO<sub>2</sub>eq per annum. This clearly illustrates that the management of invasive alien plants and bush encroachment can deliver significant ecosystem services benefits whose value outweighs the costs of restoration.

### Biography

William H L Stafford is a Life Scientist with 21 years of R&D experience covering topics ranging from biochemistry, microbial ecology, systems biology, bioenergy, permaculture, holistic resource management, industrial ecology and sustainability science. Bioenergy and bio-economy are his current research focus which requires innovative solutions to meet development objectives of economic feasibility, social acceptance, and environmental protection. He has 26 publications in peer-reviewed scientific journals and is currently a Researcher in the Green Economy Solutions competency area at the Council for Scientific and Industrial Research (CSIR), and an Associate Professor in the Department of Industrial Engineering, Stellenbosch University.

wstafford@csir.co.za

### Notes: