Ecosystem Services 24 (2017) 253–260

Contents lists available at ScienceDirect

Ecosystem Services

journal homepage: www.elsevier.com/locate/ecoser

Developed-developing world partnerships for sustainable development (2): An illustrative case for a payments for ecosystem services (PES) approach

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ARTICLE INFO

Keywords:
Renewable energy
Climate change
Restoration
Economics
Sequestration
Resilience

ABSTRACT

The Converging World (TCW) developed-developing world partnership model represents a transparent approach to addressing carbon emission management in a mutually beneficial way, with a substantial 'multiplier effect' achieved though reinvestment of operating surpluses from energy generation into tropical dry evergreen forest (TDEF) restoration. Carbon dioxide is averted/sequestered at a theoretical cost of £0.0058 £ per t CO_2e (≈$US0.01 per t CO_2e). For the City and County of Bristol, England, cumulative century-long CO_2e emissions of 256,550,000 t CO_2e could be matched by one-off investment of £3:56 for each of Bristol City's 442,500 population in commissioning a 2.1 MW wind turbine in Tamil Nadu under the TCW model. Similar considerations apply at institutional level; indicative contributory investment in turbine installation is calculated for a case study institution. Calculated investments relate to the 'anchor service' of climate regulation, though the TCW model also generates multiple co-beneficial ecosystem services serving local people and addressing UN Sustainable Development Goals. Restoration of other bioregional habitats could yield additional socio-ecological benefits. TCW's aspirational investment model positions social return on investment (SROI) as primary 'interest', rather than maximisation of financial returns to investors. We test the case for founding developing world investment on the basis for 'payments for ecosystem services' (PES).

1. Introduction

Sustainability challenges have increasingly to be tackled on a collaborative international basis. This is due to the transboundary and global nature of many common ecosystems, their associated problems and necessary management responses as for example climate stability, air pollution, fishery and other oceanic and large catchment systems. Ethical factors also demand international responses, particularly redressing the asymmetric distribution of benefits and threats resulting from historic, geographically skewed resource exploitation and development. There is a strong economic case for international responses in an increasingly globalised economy, as threats arising in one region can ripple through global markets in the forms of resource access and limitation, political turbulence, investor and customer confidence and a range of other market-influencing factors.

At an intergovernmental level, a range of these issues are subsumed into the 17 UN Sustainable Development Goals (United Nations, 2015). Many SDGs reflect the duty of already-developed states to assist developing nations with poverty alleviation and related development targets, although all relate to the goal of achieving 'The Future We Want' in developed and developing countries alike. These international commitments build upon, and are supported by, a range of developed world aid programmes and redistributive funding arrangements within major trading blocs. However, other international initiatives have a basis in market transactions between developed and developing countries. Examples include Reducing Emissions from Deforestation and Forest Degradation (REDD+), under which developing nations are incentivised to retain carbon stored in forests through conservation and sustainable management (UN REDD, 2014). The Clean Development Mechanism (CDM) is another financially based example, allowing nations with emission-reduction or emission-limitation commitments to implement emission-reduction projects in developing countries thereby earning saleable certified emission reduction (CER) credits as a contribution to meeting Kyoto Protocol targets (UNFCCC, undated). The World Bank was also established on a market basis to reduce poverty by promotion of foreign investment into and international trade with developing countries in support of capital programmes (World Bank, undated). An increasing number of international 'payment for ecosystem services' (PES) schemes are also being established, under the terms of which developed world interests pay

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http://dx.doi.org/10.1016/j.ecoser.2016.09.019
Received 27 February 2016; Received in revised form 26 September 2016; Accepted 27 September 2016
Available online 18 October 2016

Box 1.Expanded PES-related principles (from Everard et al. submitted)

Established foundational PES principles (Wunder, 2005) identify that transactions should be:

- **Voluntary**;
- Relate to a **well-defined ecosystem service**;
- 'Bought' by one of more **ecosystem service buyers**;
- 'Sold' by one or more **ecosystem service providers**; and
- **Conditional** on securing ecosystem service provision or executing measures agreed as likely to secure service supply or enhancement.Additional principles identified by Smith et al. (2013) include:
- Obeying the **Beneficiary pays principle**, a pricing approach under which consumers of the service contribute to the costs its production
- **Direct payment** made to ecosystem service providers (often via intermediaries);
- **Additional** to actions resource managers would be expected to undertake;
- **Ensuring permanence**, such that management interventions are not readily reversible; and
- **Avoiding leakage**, meaning that benefits achieved in one location are no achieved by transferring damaging practice elsewhere.Additional principles based on the 'systemic solutions' approach (Everard and McInnes, 2013) are that:
- Benefit realisation should be based on assessment across the **full range of ecosystem service outcomes**;
- Taking account of the **rights of all beneficiaries** of ecosystem services; and
- Ensuring **net societal value is optimised** rather than skewing benefits to favoured service/beneficiaries whilst overlooking non-focal service outcomes.

into developing world schemes targeting ecosystem service enhancements. These international PES schemes can address multiple services including carbon storage (REDD+ is an example), water resources, and livelihood and biodiversity security (OECD, 2010; UNEP and IUCN, undated).

Everard et al. (submitted) advances a set of expanded PES-related principles as a test for the robustness and transparency of market-based developed-developing world partnerships for sustainable progress. These principles are summarised in Box 1 with detailed descriptions in Everard et al. (submitted) but building upon foundational principles established by Wunder (2005), augmented by Smith et al. (2013) and integrating the 'systemic solutions' approach (Everard and McInnes, 2013). Ideally, decisions and management actions should account for the spectrum of ecosystem services and their beneficiaries. However, in practice, one or a few ecosystem service outcomes generally form the principal driving forces in scheme instigation. Historic practice generally prioritises maximisation of production of a focal service fitting a commercial, regulatory, or other desired end-point. This may be, for example, food or water production often for private profit, whilst overlooking potential externalities for other services and their (often public and/or non-marketed) beneficiaries. Everard (2014) describes how these driving forces for service enhancement can instead constitute an 'anchor service' around which solutions are sought, ideally in collaboration with other stakeholders in resource management and its outcomes, to optimise the co-delivery of inevitably interconnected services thereby seeking to optimise net societal benefit, cross-stakeholder equity and the resilience of the productive ecosystem.

Everard et al. (submitted) explore the case study of The Converging World (TCW) programme of low-carbon energy development in an established developed-developing partnership between south-west England and Tamil Nadu state, India (The Converging World, 2016). The TCW programme conceptually links these developed and developing world regions as a notional single country. This international conjoined regional approach to promote optimal, lowest cost progress towards an overall low-carbon trajectory is justifiable as climate change impacts are geographically independent of where carbon is emitted, captured or stored. Towards this goal, the TCW Group (operating as a network of non-profit and commercial companies including branches in India) has, at the time of writing, already installed 12.9 MW of wind turbine capacity in Tamil Nadu to promote low-carbon development supported by funding from the donor region (south-west England). Benefits accrue from low-carbon energy inputs to the Indian grid, averting emissions from the conventional Indian energy mix. However, the TCW model is based on reinvestment of a significant proportion of operating surpluses from renewable energy sales into eco-restoration of tropical dry evergreen forest (TDEF). TDEF is a regionally representative habitat type, best described as a biome with a number of indicative species and tree types rather than a distinctive species assemblage (Gadgil and Meher-Homji, 1986) that has been severely depleted in the coastal regional of Tamil Nadu over recent decades (Pitchandikulam Forest and Bio-Resource Centre, undated). At the time of writing, a little over 30 acres (just over 12 ha) of TDEF reforestation has taken place at Nadukuppam in the Kaliveli catchment of Tamil Nadu, with more land available to buy and put into trust as the scheme progresses (Fig. 1).

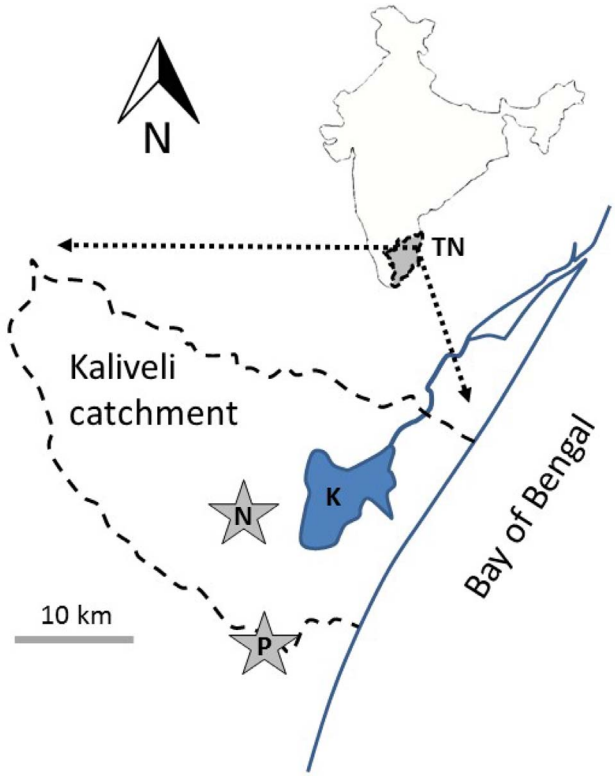

Fig. 1. The Kaliveli catchment in Tamil Nadu (TN) state, India, showing Kaliveli Lake (K) and the approximate locations of Pitchandikulam Forest (P) and the Nadukuppam restoration area (N).