

STEEP learning curve

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Re-establishing selected natural habitats is likely to benefit society as much as traditional infrastructure according to a report commissioned by the RICS Research Trust. Mark Everard discusses the findings

The global [Millennium Ecosystem Assessment of 2005](#) and the [UK National Ecosystem Assessments carried out in 2011 and 2014](#) have found that the exploitation of land and other natural resources to serve humanity's rapidly growing demands has resulted in serious, continuing degradation of most major habitat types.

Ecosystem damage in the last 50 years of the 20th century exceeded any comparable period of human history. Contemporary demands are estimated to consume the resources of one and a half Earths, according to the Global Footprint Network. While these pressures are not subsiding, there is an urgent need to use landscapes and other ecosystems more sustainably.

A RICS Research Trust report, [Regenerative landscapes: Rejuvenation of linked livelihoods and catchment ecosystem services](#), supports [UK Natural Capital Committee calculations of 2015](#) that show that targeted re-establishment of forests, wetlands, urban green spaces, saltmarshes and other habitats is likely to offer net returns to society at least as great as those from investment in traditional engineered infrastructure.

The STEEP framework

Thinking in systemically connected ways is vital if we are to make more sustainable decisions. There are many models that help achieve this, some of them already used to assess habitat management and reestablishment. One that has proven particularly helpful across the world is the social, technological, environmental, economic and political (STEEP) framework.

Although it was initially developed to categorise strategic business issues, STEEP has been systemically applied by looking at the complex interactions between its 5 principal elements. Systemic application of STEEP provides a conceptual framework to better understand the broader, interconnected socio-ecological outcomes of any action, such as the implementation of a technical solution or land-use management regime.

Though often applied for narrowly targeted outcomes, all such regimes have broad implications for ecosystems and the wider distribution of benefits and costs of their dependent stakeholders. Implementation of technologies and management regimes is also shaped by policy and market environments, and by power relationships between different societal groups.

Regenerative landscapes

The term 'regenerative landscapes' refers to the use and management of natural resources to optimise the range of processes they perform and benefits they provide. In turn, the phrase

'systemic solutions' describes techniques that work with natural processes to ensure the best outcomes across all ecosystem services.

A practical example is the transition in thinking about flood risk management from an historic focus on erecting defences around buildings, farms, infrastructure and other assets towards catchment-scale natural flood management that retains flood water and buffer flows. This ecosystem-centred approach offers multiple benefits such as rehabilitating wetlands and wildlife-friendly riparian habitat, natural regeneration of fisheries, landscape aesthetics, carbon sequestration and nutrient cycling. Systemic solutions highlight the need for governance and reward systems that better reflect net value to all in society, both now and tomorrow, chiming with present government thinking about the shape of agri-environment subsidies after Brexit.

Planning systemically

Natural resource use that targets a narrow range of ecosystem service benefits, such as contemporary intensive farming or residential development on floodplains, can inadvertently undermine ecosystem integrity and wider societal interests. Degradation of these wider benefits, including the resilience of the ecosystem, creates degenerative rather than regenerative landscapes.

The Regenerative landscapes report applies the STEEP framework and explores many such instances of the 'business as usual' model of natural resource use. Significantly, it then turns to application of the framework to explore exemplars of regenerative landscapes from across the world, where ecosystem-based thinking has successfully retained or rebuilt the integrity and functioning of supporting habitats along with their capacities to sustain continuing human wellbeing, including examples that have raised people out of poverty.

Restoration in Rajasthan

Many pressing challenges in the developing world relate to degradation of the water cycle, a threat also increasingly impinging on regions of the developed world. One initiative covered in the report is in the semi-arid Alwar district of the state of Rajasthan, India. With the support of the NGO Tarun Bharat Sangh (TBS), many villages in the district have restored former community-based catchment regeneration methods, using novel solutions that are based on traditional, local knowledge.

These enable sporadic run-off from monsoon rainfall to recharge groundwater, with careful stewardship supporting year-round, efficient uses. Better still, collaboration between villages at the catchment scale has restored not only water systems but also forests and other linked ecosystems.

The return of perennial surface water where rivers formerly vanished between monsoons has reanimated the socio-ecological systems of whole catchments and reversed cycles of poverty and village abandonment. TBS has worked with hundreds of villages in Rajasthan, advising on and directing international donor funding to geographically appropriate water-harvesting measures and, just as importantly, reinstituting traditional communal governance arrangements and empowering women.

The NGO WaterHarvest, known for the 30 years prior to 2017 as Wells for India, is also based in Rajasthan and has played a significant role over the past 3 decades in providing education, expert advice and directing financial support to help local communities and NGOs, including TBS, regenerate water systems supporting human wellbeing. [WaterHarvest](#) has been working increasingly closely with the government of Rajasthan, offering strategic outreach to *Mukhya Mantri Jal Swavlamban Abhiyan*, the ambitious water self-sufficiency mission of the state's chief minister that aims to empower villagers to regain control of their local water supply using

practices adapted to geographical, cultural and intensely episodic rainfall conditions.

Sustainable schemes

The [Upstream Thinking programme](#) in south-west England, New York city's water supply and the Sustainable Catchment Management Programme in north-west England are 3 schemes also covered by the report. These focus on systemic solutions to protect raw water quality at source, rather than managing more contaminated water at the point of abstraction. All 3 have cut water treatment costs and helped protect fisheries, biodiversity, rural incomes and ecotourism, among other benefits.

At a grander scale, the report includes China's Loess Plateau project, in which measures such as tree planting, terracing and zoned land use have stabilised highly erosive soil, retaining water and nutrients and making major contributions to lifting millions of people out of poverty. The Loess Plateau project demonstrates that large-scale landscape regeneration of socio-ecological systems is possible with vision, knowledge, policy, funding and the involvement of local people.

A range of other forest-related examples in the report, from places such as Costa Rica, New Zealand and the UK, highlight how consideration of broader outcomes when investing in so-called anchor services – which drive marketable or priority policy outcomes relating for example to water, biodiversity, carbon storage or tribal lifestyles – can promote conservation and regeneration of forests.

Landscape lessons

Contemporary sustainability challenges are difficult or impossible to solve simply because of incomplete knowledge, contradictory and changing requirements, and complex interdependencies.

Taking account of the multiplicity of outcomes arising from natural resource exploitation and management is vital if the primary capital of ecosystems and their supportive processes is not to be degraded along with its capacities to support humanity into the future. Doing so by finding systemic solutions in broader socio-political contexts is an ever-more pressing need. Meeting this need can be guided by consideration of interacting elements of the STEEP model, including integrating:

- social factors, such as a shift from competitive management to recognising implications for all beneficiaries or victims
- technological factors: realising that technology choice has multiple, broader consequences beyond the often narrow benefits for which solutions have tended formerly to have been applied
- environmental factors: recognising ecosystem resilience and processes as primary capital to be protected or restored to secure continuing and equitable wellbeing
- economic factors: considering overall distribution of costs and benefits, both now and in the longer term
- political and governance factors, tiered from high-level policy to local scales, enabling sustainable and equitable decision-making that takes into account natural resource limits and the needs of all in society.

The report provides a practical context for this work by applying lessons to 2 contrasting challenges: developing world water management; and ensuring that intensive farming in the developed world is sustainable.

There is a strong case for society to recognise the multiple benefits and greater security

provided by the regeneration or more sustainable use of landscapes. A systemic approach using the STEEP framework can inform transparent assessment, design and policy reform necessary to promote both large-scale land-use measures and more localised, community-based approaches nuanced to local circumstances.

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Further information

- [UN Water, World Water Development Report 2018](#)
- Related competencies include [Management of the natural environment and landscape](#) , [Sustainability](#)
- This feature is taken from the [RICS Land journal](#) (July/August 2018)
- Related categories: [Land and resource management](#) , [Flood remediation](#) , [Flood risk](#)