



The lock-in dynamics ‘locking-out’ nature in England

Dr Meghan Alexander and Dr Tim Rayner, University of East Anglia, UK



Context

- Government commitment to be '*the first generation to leave the environment in a better state*'
- Failure to deliver on environmental targets
- 41% of species have declined since the 1970s
- 15% of species face extinction
- Risks to the viability and diversity of terrestrial habitats and species from multiple hazards is a priority risks area



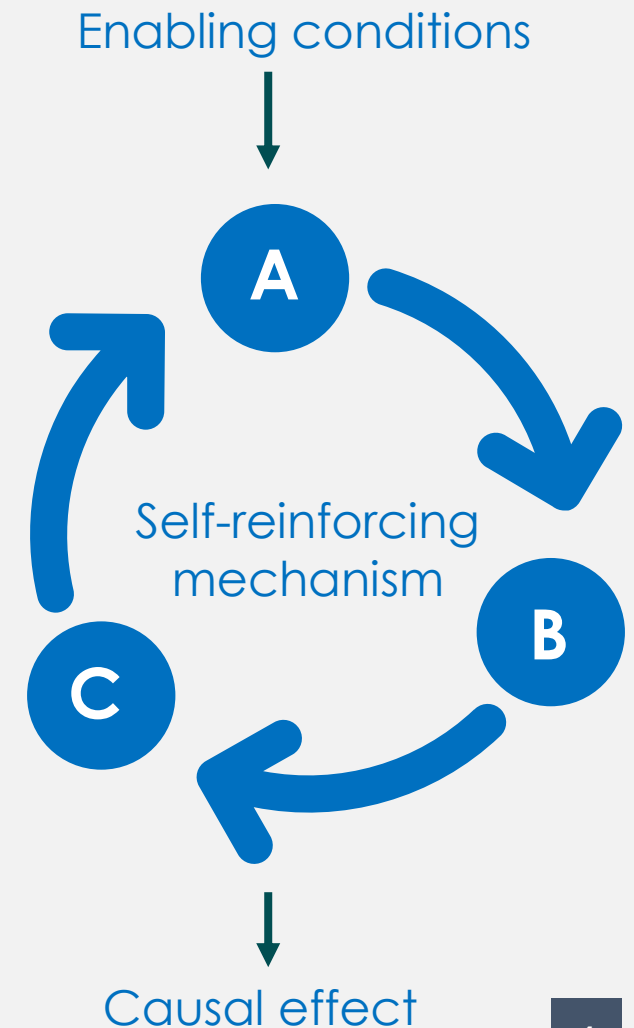
Context

- **Pressures driving net losses in biodiversity** - agriculture, urbanisation, pollution, hydrological change, woodland/forestry management and invasive non-native species + climate change
- **A host of barriers** have been documented
- Is there more to the story?
- Is there evidence of self-reinforcing mechanisms and feedbacks?
- **To what extent, are efforts to preserve and enhance biodiversity under future climate change hindered by lock-in dynamics?**



What are the features of a lock-in dynamic?

- Documented in different bodies of literature (e.g. economics, political science, STS, geography and climate mitigation)
- **A lock-in describes a self-reinforcing dynamic**, forged through certain mechanisms and feedbacks
- **Mechanisms** (made up of entities, their properties, actions and relations) have a causal effect. Mechanisms are enabled under specific contextual conditions.
- **Causal effect** - preserves business-as-usual & alternatives are restricted



Previously identified lock-in mechanisms

	Lock-in mechanism	Description
<i>Known mechanisms</i>	Economies of scale	This mechanism is typically described in the context of production capacity and units of production; as production becomes more efficient and the scale of the operation increases, costs are spread across units of production, which decreases the cost per unit and generates cost advantages (Arthur, 1994). Though typically related to technologies and infrastructures, it is also applicable to specific approaches in CCA (such as the scaling-up of Natural Flood Management techniques).
	Adaptive expectations	Individuals, organisations and actor groups adjust their expectations and actions based on their perceptions of what others will do; i.e. 'it derives from the self-fulfilling nature of expectations' (Pierson, 2000, p. 254).
	Learning effects	Increasing benefits result from 'learning by doing' and 'learning by using' associated with the development, production and/or application of a specific technology, product or approach (Arthur, 1994). The acquisition of knowledge and skills enables incremental improvements, which in turn promote continued use (David, 1985).
	Collective action	Problems and solutions for complex environmental issues are framed and (re)produced through social networks, culminating in shared views and commitment towards collective action (Klitkou et al., 2015).
	Habituation	Actors develop attachment towards certain approaches or technologies even when potentially superior alternatives exist. This is driven through routines and repetition and strengthened by actors' preference to weigh earlier gains compared to future efforts (Barnes et al., 2004; Kotilainen et al., 2019).
	Power differentiation	Actors impose rules on others and/or implement rule changes or a specific course of action to strengthen their position of power and advance their agenda. This mechanism is referred to in the literature under various guises, as 'differentiation of power and institutions' (Klitkou et al., 2015; Kotilainen et al., 2019) or 'power asymmetries' (Foxon, 2002; 2010).
	Economies of scope	This refers to the cost and/or competitive advantages induced by the production and use of a broader range of products (rather than specialising in the production of one type) (David, 1985; Klitkou et al., 2015).
	Institutional learning effects	The increased adoption of institutions over time leads to complementary institutions. This can lead to a range of potential benefits, such as improved coordination and efficiencies, but may also have undesired consequences -e.g. increased complexity and interdependencies may prove resistant to change (Foxon, 2002; Kotilainen et al., 2019).
	Network effects	Where there are (increasing) advantages of adopting a specific technology, product or approach, it becomes more widely used (Ebbinghaus, 2005). This mechanism has also been described as 'network economies' (Arthur, 1994; Janipour et al., 2020) and 'co-ordination effects' (Foxon, 2002).

Some examples

Methods

- Adapt Lock-in project (<https://adaptlockin.eu/>)
- Document analysis, including key policies and legislation
- Stakeholder interviews (cross-sectoral)
- Process tracing
- **Is there evidence of lock-in dynamics?**
- **To what extent are adaptation gaps attributable to lock-in dynamics?**



22 interviews



Analysed for
key themes



100+ documents



Process tracing

Agricultural policy

- Farming framed as both the problem and the solution
- **Economies of scale** constructed and maintained through Common Agricultural Policy (CAP), incentivises intensive agricultural practices focused on productivity
- **Adaptive expectations**, amongst retailers and consumers, driving demand for cheap food, and **cognitive switching costs** of switching to alternatives

“

I think once you've offered the consumer that level of choice at the price point that they've got it, it's very difficult to walk away from'

”

'...the price point is set and ultimately you've got to find a way to produce to that price point and if you ... as the value of units of production has fallen, farmers find a way of trying to be more efficient to produce to that price point

Agricultural policy

- **Differentiations of power** - large supermarkets have a monopoly on food retail and setting the price point
- Reinforces economies of scale mechanism to the detriment of the environment
- **‘Unlocking’ interventions** need to span the farming sector, retailers, market and societal consumption behaviours
- **Opportunities:** Withdrawal from CAP and new Environmental Land Management Schemes (ELMS)

British farmers forced to pay the cost of supermarket price wars

UK farmers sceptical after minister urges them to ‘stand ground’ on fair prices

“

while it's the cheapest common denominator which is the one that flies off the shelf, then that's the standard that everyone's going to produce to... farming is definitely part of the solution but markets and consumers are a crucial part ... ultimately it's people with buying patterns that will shape behaviour and shape change [...] so for me it's a societal problem ... unless we all act together we will probably be pushing water uphill [NFU]

”

Environmental policy & conservation

- Shifting attitudes and culture within conservation
 - **Habituation**
 - **Frame (re)production** – framing of problems/solutions
 - Unless philosophical debates about conservation futures are addressed, there is a risk of continued **escalation of commitment**
- **Legal lock-ins** - the stated legal purpose of AONB and National Parks under 1949 legislation, not conducive to wider biodiversity, ecosystem services or nature recovery
- **Barriers** – funding cuts, poor monitoring, absence of statutory interim and long-term targets, lack of accountability mechanisms, complexity of designation process, etc.



It's very emotion led ...so many people that are so passionate about a species or a way of a landscape looking, that that really has a huge bearing on how conservation works in the UK

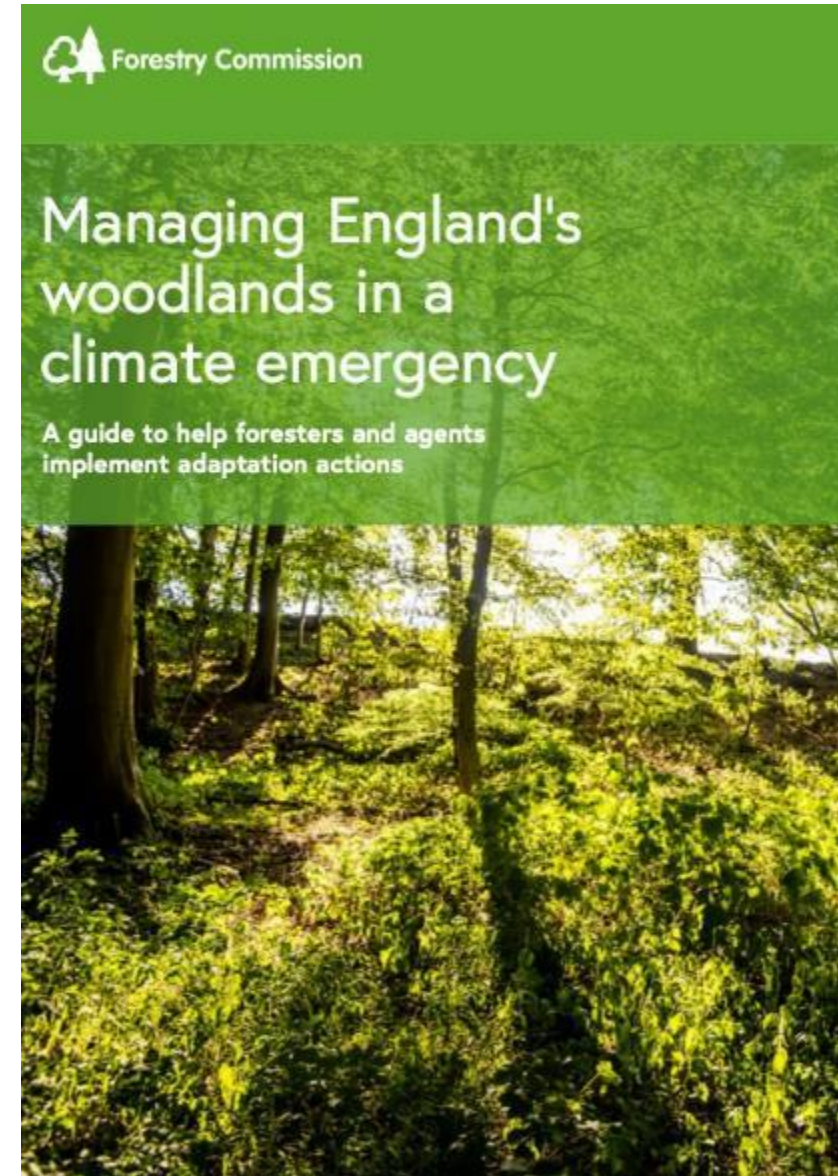


Forestry & woodlands

Opportunities: Diversification of tree species and increased management could deliver more resilient forests/woodlands and greater biodiversity benefits.

But some practices may be slow to change:

- **Economies of scale** / profit-seeking still favour monoculture plantations; management of woodlands - where ownership very fragmented - lacks such economies.
- **Frame polarisation** (divergence of values and beliefs across groups) risks certain adaptation strategies (e.g. 'assisted migration') becoming contested.
- **Adaptive expectations** - farmer/ land-owner mistrust based on long history of mismanagement of past agricultural subsidy schemes
- **Barriers** – under-resourcing, policy trade-offs e.g. rapid planting for Net Zero targets prioritised over on-going management.



Other dynamics being studied

Research is ongoing ...

- **Economic system** – changing measures of success and better accounting for natural capital and biodiversity
- **Spatial planning** and vested interests of developers
- **Political dynamics** - leadership, turf wars, coordination deficits and responsibility avoidance

The Economics of
Biodiversity: The
Dasgupta Review

Abridged Version



Conclusions

- Translating rhetoric into action: From talk to walk
- **Emerging opportunities for change**
 - Environment Act 2021, including a legally-binding target for species abundance for 2030
 - Environmental Land Management Schemes (ELMS)
 - Biodiversity net gain in spatial planning
 - Enhanced incentives for tree planting and management, alongside UK Forestry Standard revision (due 2022).
- **Addressing recurring barriers** – e.g. resourcing/funding, gaining political currency, addressing siloed governance etc.
- **Recognition and intervention of deeper lock-in dynamics** - Could the identification of self-reinforcing mechanisms help inform ‘unlocking’ strategies?



Thank you!



m.alexander@uea.ac.uk



@DrMeg_Alexander

