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Spatial discontinuities and panarchy theory: for a better management of agriculture/forest interfaces

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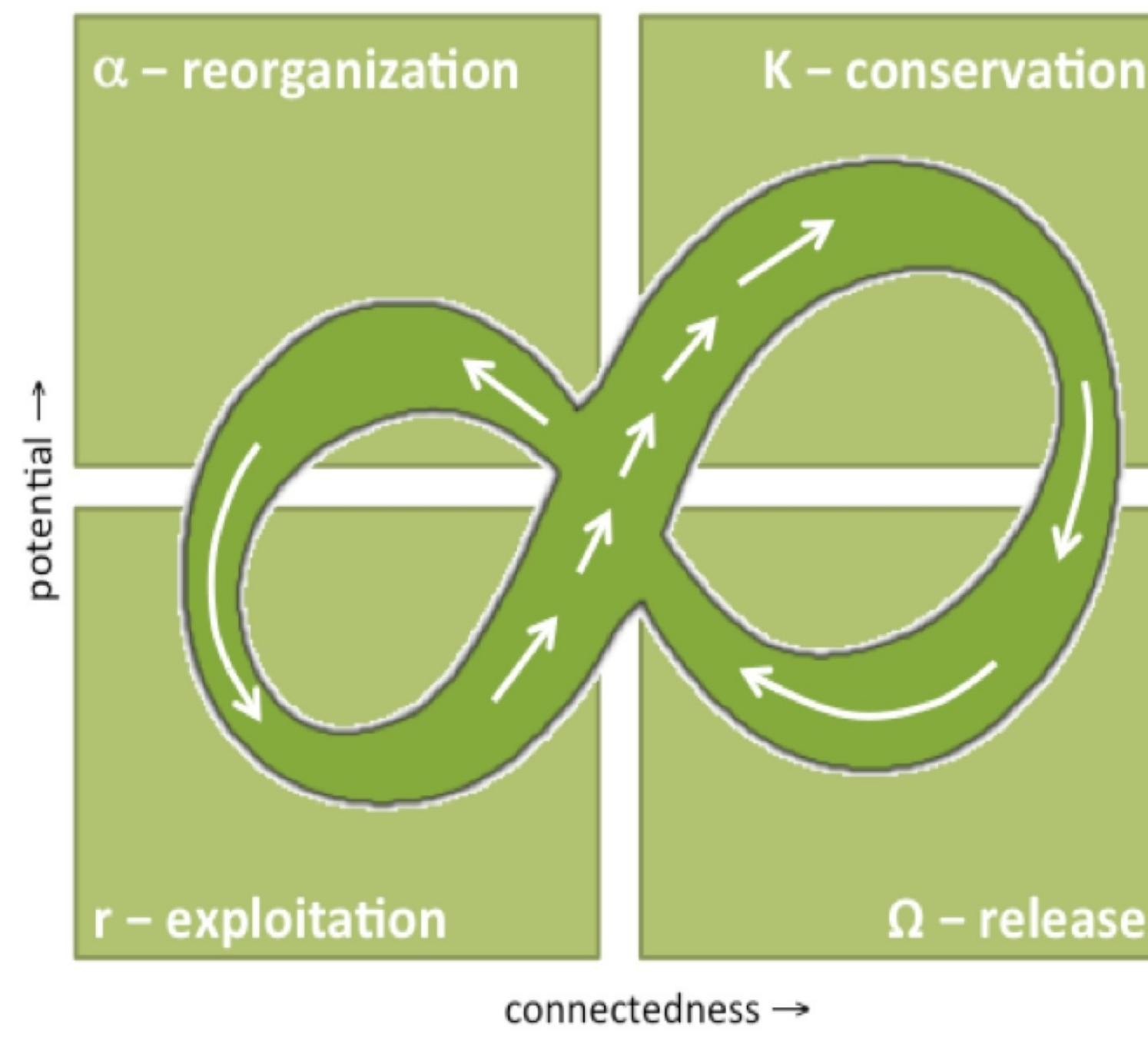
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Spatial discontinuities and panarchy theory : for a better management of agriculture/forest interfaces

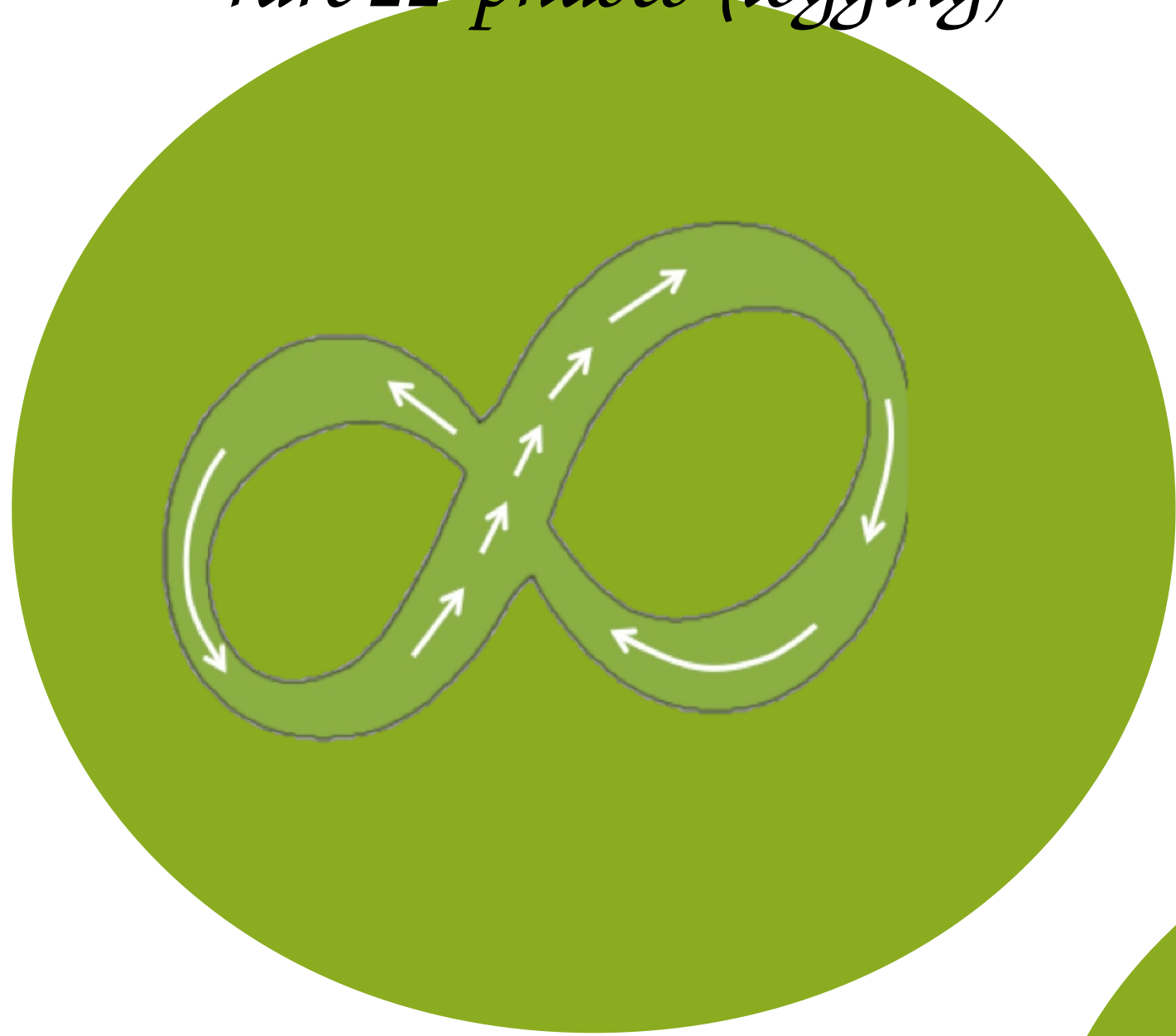
System dynamics:
adaptive cycle



Forest: slow system
Long \mathcal{K} phase,
rare Ω phases (logging)



Crop: fast system
Short \mathcal{K} phase,
frequent Ω phases (harvesting)



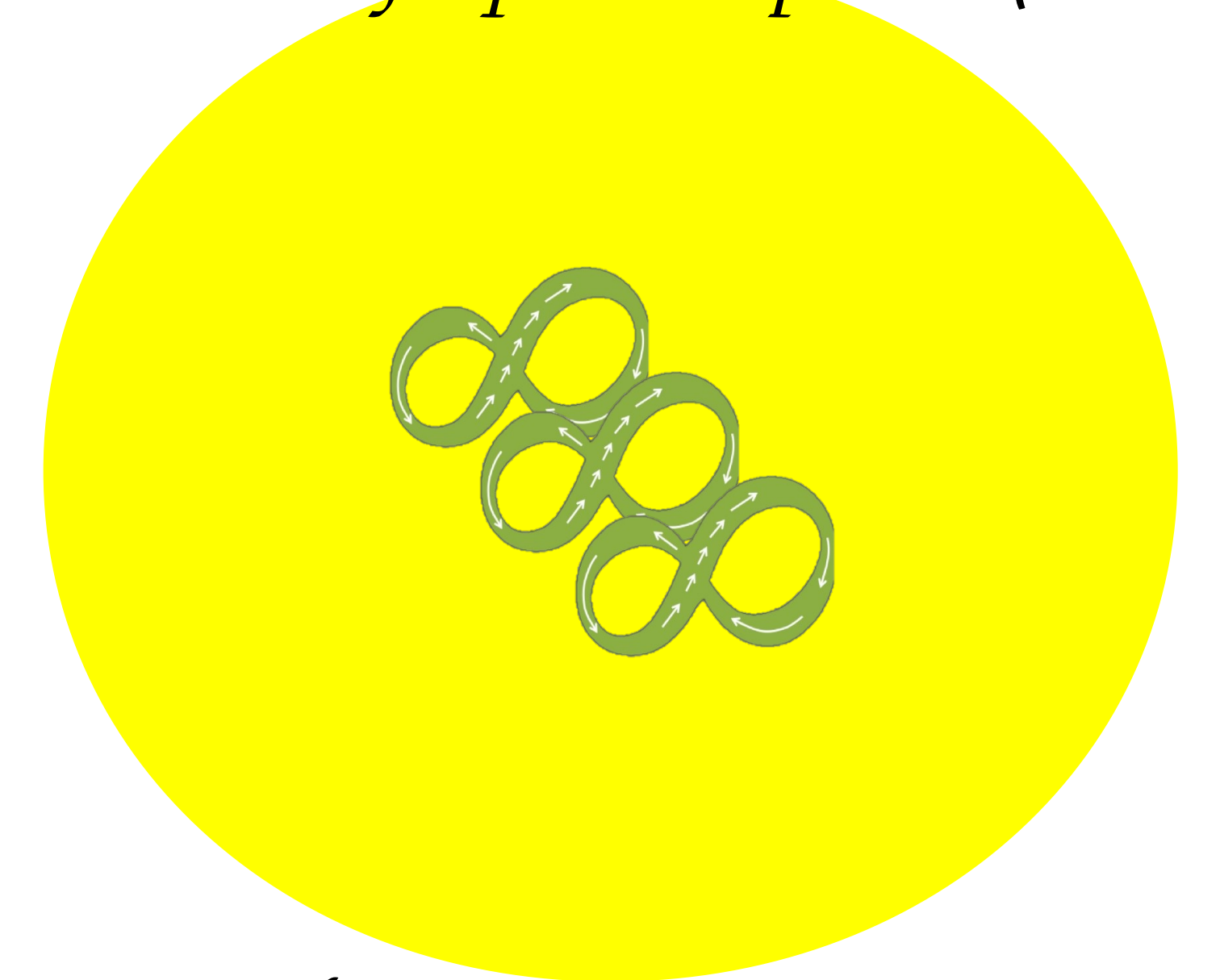
Both habitats are influenced near
their shared border.

Edge is the area of influence.



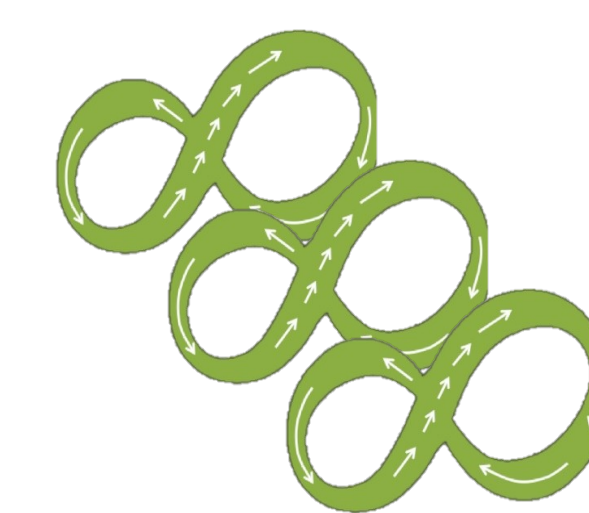
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Edge effect



Biodiversity, ecosystem services,
resource usages are modified by edge
effects.

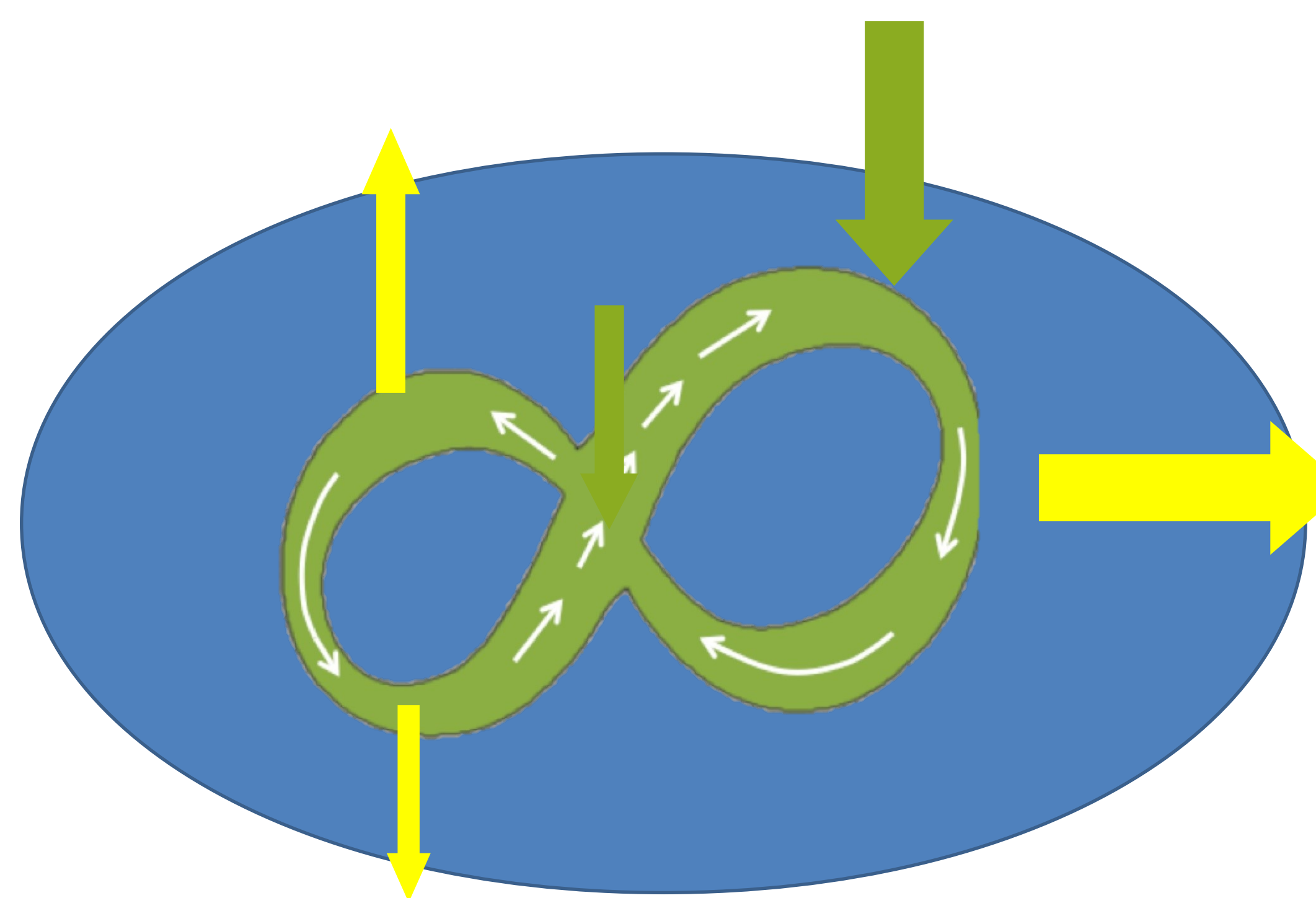
Controlling edge effect is crucial for a
better land management



How do the slow and the fast systems spatially interact ?

During the \mathcal{K} phase, the connectedness of the
system increases: it influences its outside.
During the other phases, the system is more
open and is influenced by its outside:

- Strong influence may trigger Ω phase
- Lower influences contribute to α and r
phases, providing novelty and resources



Spatial interface of the complex system

Forest influences crop dynamics
most of the time (long \mathcal{K} phase).

Crop may influence forest
dynamics during regeneration
phases (Ω , α , r)