Integrating ecosystem services and resilience toward sustainability

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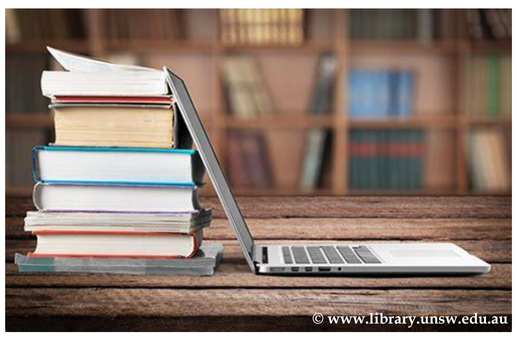
Context

Answers: Ecosystem services ↕? Resilience → ? → Sustainability

Objective: Analyzing the strengths and weaknesses of ecosystem services (ES) and resilience as well as their relationships, to see how to operationalize them toward sustainability

Methodology

Literature review



Interviews with experts in the field(s) of ES or/and resilience

Results

Resilience

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ES

	Similarity	Difference
History	Increasing popularity	Resilience is an older word but a new idea
	Increasing development (operationalization + socio-cultural aspects)	Resilience many origins vs ES a bridging concept
		Resilience not born to answer environmental crisis
Focus	Sustainability; biodiversity conservation	Change (resilience) vs human-nature relationships (ES)
	Social-ecological system (SES)	Functioning (resilience) vs outputs (ES)
	System integrity	ES focuses on SES vs resilience any system
Feature	Polysemic; boundary object; transdisciplinary	Resilience greater variability in its definitions
	Normative	ES intrinsically normative
	Holistic; multidimensional	Theoretical (resilience) vs applied (ES)
Practice	Difficult to operationalize; simplification	ES are more tangible (directly measurable)
	Various methods	ES assessment integrates more multiple values and stakeholders
	Informing decision-making	
	Communication; awareness	ES more powerful tool of communication

Resilience

↕

ES

Pairing type	
Resilience X ES	Integrated conceptual framework
	Integrated assessment framework
	Management of resilience & ES
	Decision-making on ES & resilience
Resilience of ES	Resilience of ES
	Assessment of the resilience of ES
	Management of the resilience of ES
Resilience < ES	Adaptation services
	Resilience in ES typology
	ES assessment to assess resilience
	Influence of ES management on resilience
Resilience > ES	Resilience = prerequisite for ES
	Application of resilience theory on ES
	Resilience assessment for ES assessment
	Influence of resilience management on ES

Why or why not pairing them?	
+	- Resilience/ES contributes to ES/resilience/sustainability
	- Resilience/ES is mandatory to ES/resilience/sustainability
	- Resilience & ES supplement each other
	- Pairing ES & resilience brings new insights
-	- ES/resilience creates pitfalls for resilience/ES
	- ES/resilience is unfavorable to resilience /ES
	- Pairing ES & resilience complexifies their implementation

Conclusion

- ES & resilience share commonalities but are quite different
- Multiple ways of pairing ES & resilience
- Pairing ES & resilience is mainly beneficial
- However, in some cases no need to pair + caution to avoid traps of one concept overriding the other
- Pairing ES & resilience can promote sustainability

Take-home messages

- ES & resilience, two separate concepts but closely interlinked
- Pairing but not combining them can promote sustainability if the context asks for it but proceed with caution

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