

Assessment Methods to Achieve Sustainability



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PRESENTATION

- Methods of assessment for sustainability based on adaptive cycle
 - cumulative impact assessment
 - resilience assessment
 - recovery assessment
- Applications in Australia
 - social impacts of power station closures
 - management of endangered ecosystems
 - land use and management of coal mine closures
- Assessments of transition to sustainability
 - not required in Australia
 - critically important for energy and ecosystem transitions
 - different from traditional impact assessment

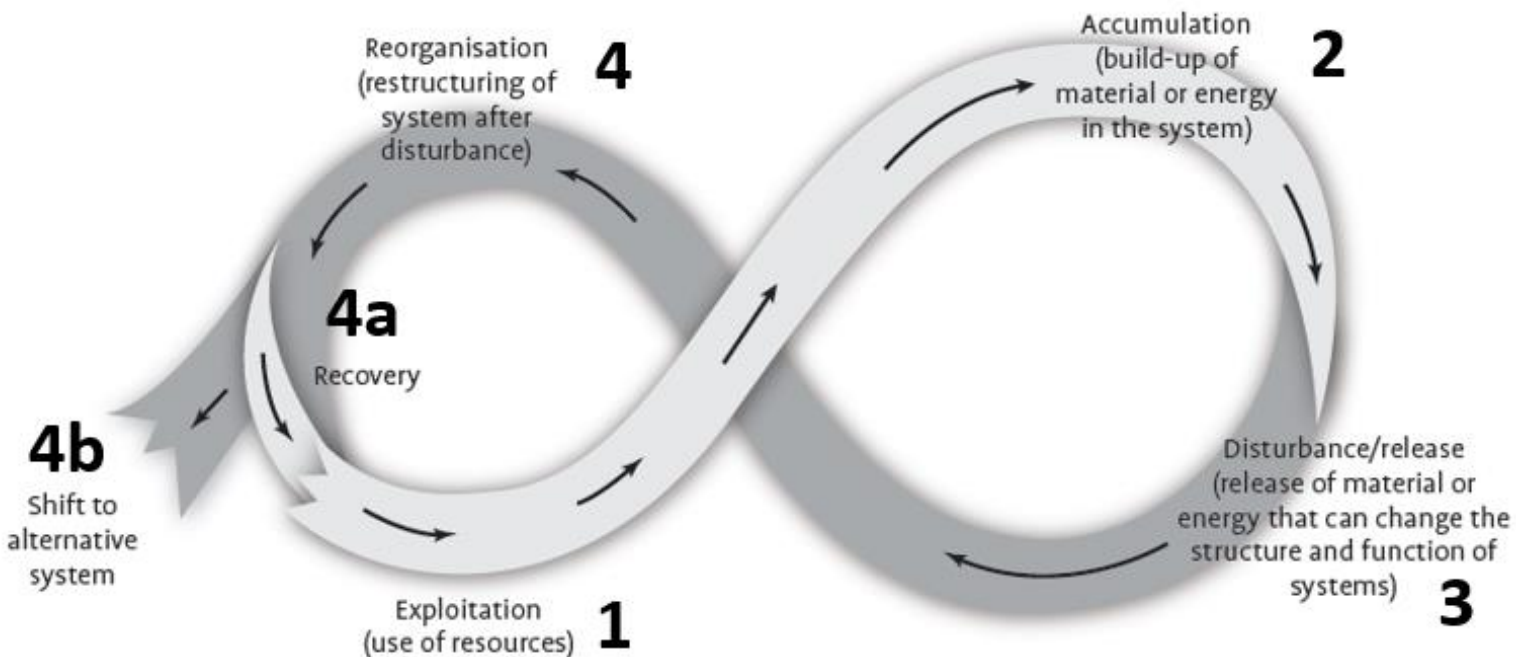


PROJECT IMPACT ASSESSMENT

- IA practice focussed on proponents mitigating adverse effects of proposed developments
- IA has achieved a degree of success
- IA has not prevented overall development to threaten sustainability
- Need different assessment methods when sustainability limits threatened

OPERATIONAL BASIS FOR SUSTAINABILITY

- From Panarchy theory, the adaptive cycle describes how ecological or social systems can be sustained



Adapted from Gunderson and Holling 2002

PHASES OF ADAPTIVE CYCLE

1 Exploitation

- Use of resources

2 Accumulation

- Build-up of material or energy

3 Disturbance

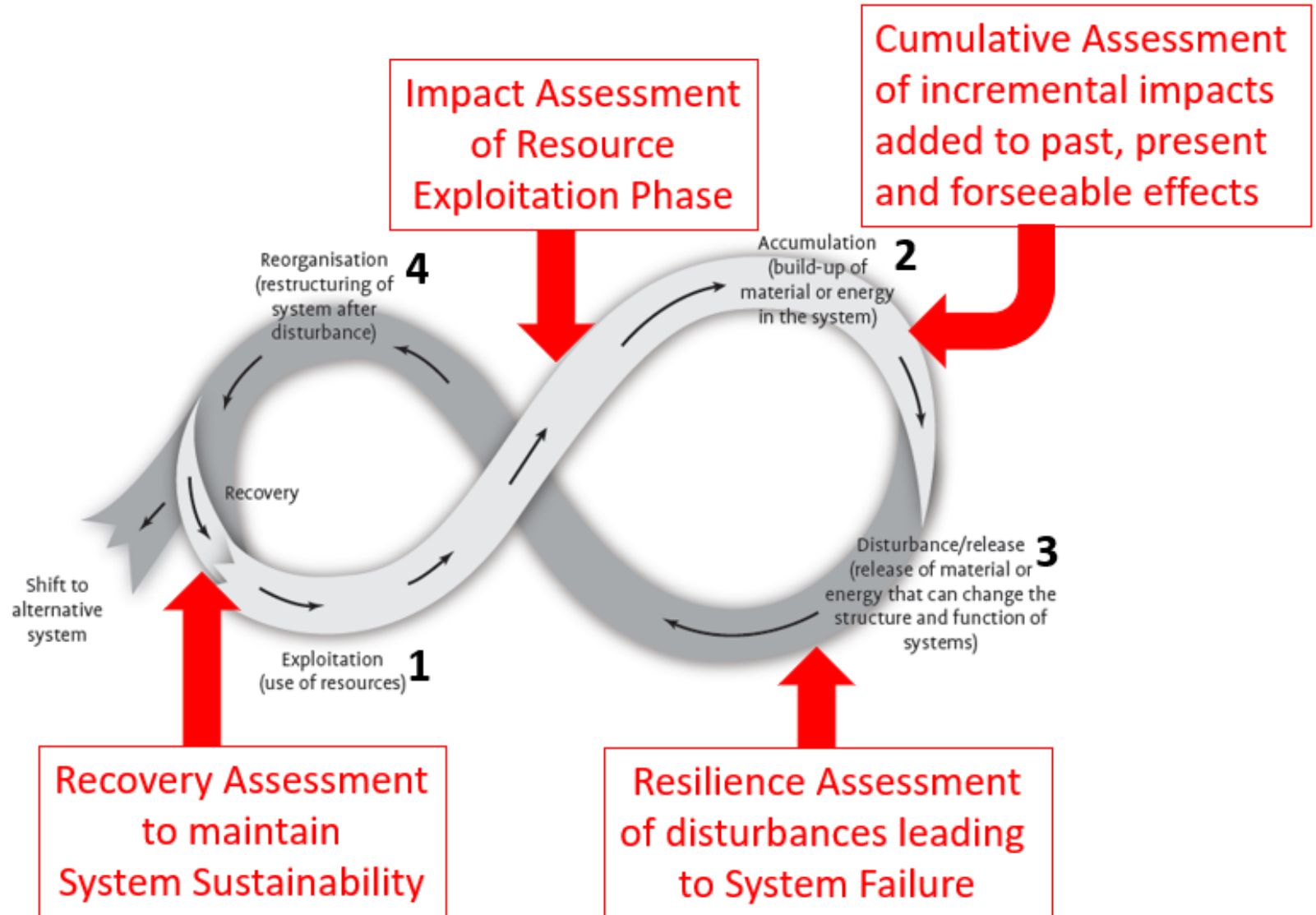
- Release that can change system

4 Reorganisation

- 4a Recovery, or
- 4b Shift to alternative system

TYPES OF ASSESSMENT AND THE ADAPTIVE CYCLE

- Assessment associated with each phase of the adaptive cycle



ASSESSMENT METHODS

Exploitation Phase

- impact assessment

Accumulation Phase

- cumulative impact assessment

Disturbance Phase

- resilience assessment

Reorganisation Phase

- recovery assessment

CUMULATIVE IMPACT ASSESSMENT

- Cumulative impact
 - the impact on the environment which results from the environmental impact of the action when added to other present and reasonably foreseeable actions
- Cumulative impact assessment
 - the additive effects of proposals that individually are of minor or moderate significance but in total have an effect of major significance
- Global emission reduction targets to limit cumulative effects on climate
 - Australia, coal-fired power plants a major contributor: close most by 2035
 - Plant closures have the potential for significant social impacts



**Hazelwood
Power Station
closed 2017**



**Morwell
unemployment
11% 2013
17% 2017**

MEASURES TAKEN IN RELATION TO CLOSURE

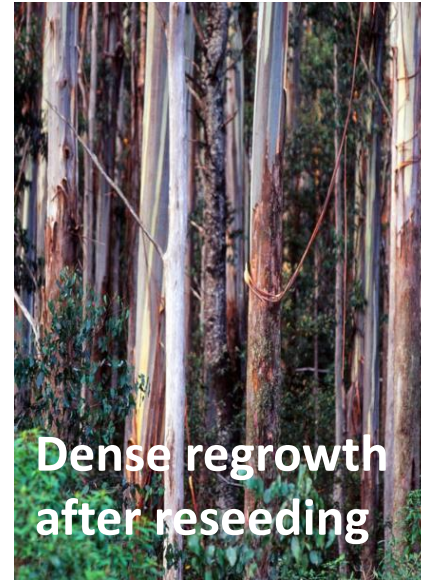
- Government assistance
 - Worker transfer scheme (\$20m)
 - Assistance package for affected workers (\$43m)
 - Latrobe Valley Authority to lead work on economic transition strategies
 - Funding for growth promotion (\$224m)
 - Additional funding for infrastructure (\$384m)
- Project outcomes
 - SEA Electric EV car manufacturing plant (500 jobs) lost to Los Angeles which offered contract for 1500 electric trucks
 - Latrobe Magnesium demonstration plant for magnesium from flyash (\$25m)
 - Solar Victoria Morwell plant (solar panel manufacture)
 - Delburn Wind Farm 185 MW (\$233m)
 - Hazelwood Solar (70MW) and Battery (3-30MW) (\$105m)

RESILIENCE ASSESSMENT

- Resilience is the capacity of a system to absorb disturbance and still retain its basic function and structure
- Resilience assessment
 - identification of **failure pathways** that have the potential to cause system failure and shift the system to an alternative degraded state
 - **critical variables** are measures that characterise the processes on failure pathways
 - **thresholds** are the tipping points for critical variables that can change the state or function of a socio-ecological system

RED LIST ECOSYSTEMS: MOUNTAIN ASH FORESTS

- Red List Ecosystems: ecosystem risk assessment using resilience concepts
 - define ecosystem process and function (adaptive cycle)
 - diagnose threats and pathways to collapse (failure pathways)
 - identify indicators of decline and collapse (critical variables and thresholds)
- Mountain Ash Forests of Victorian Central Highlands
 - dense regrowth after logging increases fire frequency leading to loss of old growth forest and species replacement
- Resilience Assessment
 - future decline due to climate change
 - severe decline in hollow-bearing trees
 - loss of old growth forests



VICTORIAN GOVERNMENT APPROACH TO LOGGING

- **Announcement December 2019**
 - immediately protect threatened species habitat and cease logging old growth forests
 - stop logging of native forests by 2030 with initial step down in 2024
 - investment in plantation timber (but new plantations not ready to offset native reduction)
- **Business Support Package**
 - support transition to plantation timber
 - opt out package
 - mill site rehabilitation
- **Worker Support Package**
 - retraining and re-employment assistance
 - top-ups for redundancy payments
 - mental well being support
- **Community Support Package**
 - grants for local businesses



RECOVERY ASSESSMENT

- Process of developing management interventions to address environmental damage and degradation
- Proactive environmental improvements to achieve sustainable outcomes
- Closure of Point Henry smelter led to closure of coal mine and power station
 - Government planning with Alcoa & community
 - site sold to become an environmental tourist attraction with mine pit as lake
 - on mine closure acidity in estuary increased
 - hydrogeological modelling to explain if catchment or mine-related



SCALE AND TIMING OF TRANSITION STRATEGIES

- Scale of transition needs to address the scale of the loss of the activity subject to closure, and
- Starting a transition strategy at the time of closure is too late: Need
 - sustainable alternative already in place to meet energy demand or wood supply
 - jobs to replace those lost by plant closure available to manage job losses and community socio-economic impacts
 - new skill requirements to have been identified and available to meet new industry requirements
 - environmental investigations for regional effects of plant closure, rehabilitation and new industries to have been undertaken
 - future land use decisions for sustainable transition to have been agreed
 - feasibility studies for new industries to have been undertaken

ASSESSMENTS FOR DEVELOPMENTS AND CLOSURES

PROPOSED DEVELOPMENT	PROPOSED CLOSURE
New development to meet proponent's interests	Transition to alternative sustainable future
Proponent-led impact assessment	Government-coordinated sustainability assessment in partnership with industry and communities
Community engagement through impact assessment process	Community engagement in decision making process

To achieve transitions to sustainable outcomes requires a different approach to assessments compared to impact assessment of proposed developments

Let's continue the conversation!

Post questions and comments in the IAIA23 app.

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