



# Significance of Environment in the Assessment of Sustainable Development: The case for South West Victoria.



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## Outline

- Models of sustainability
- Sustainability assessment
- South West Victoria example - An Index of Regional Sustainability (AIRS)
- Process of sustainability assessment development



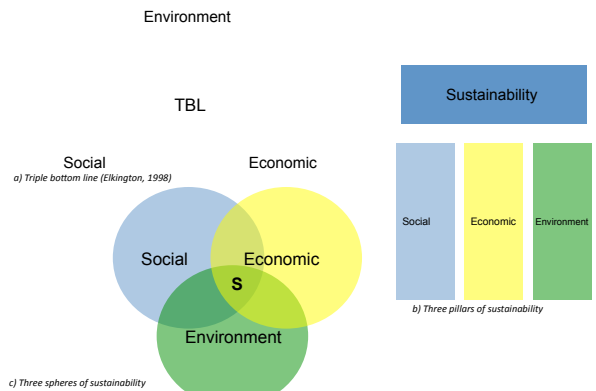
## Models of Sustainability

- Models developed to help frame sustainability
- Beginnings in environmental monitoring
  - Pressure-Response & Drivers-Pressure-State-Impact-Response
- Many models have evolved from Brundtland's definition of sustainability:

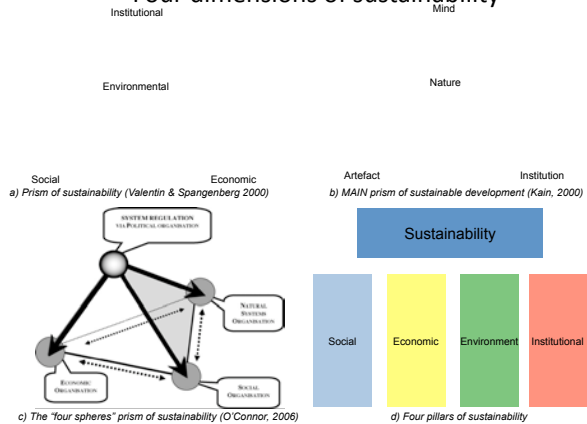
*'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'* (Brundtland, 1987 p43)



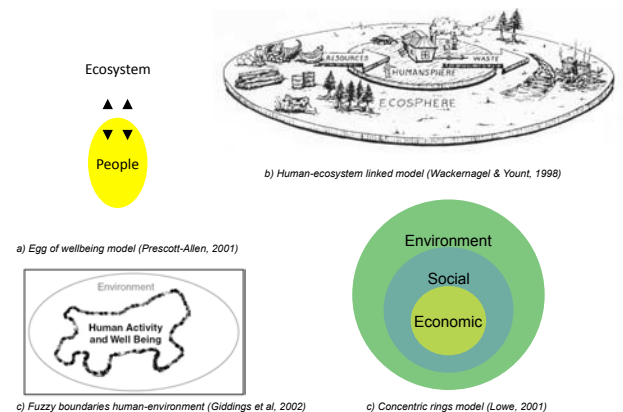
## Three dimensions of sustainability



## Four dimensions of sustainability



## Linked Human-Ecosystem

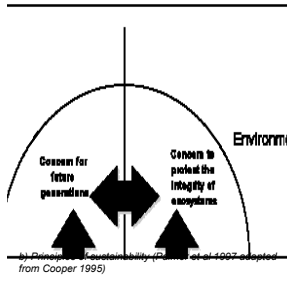


# Principles of Sustainability

## Sustainability



a) Principles of sustainability (Haughton, 1999)



b) Principles of sustainability (Peters et al. 2007 adopted from Cooper 1995)

- Environmentally determined**
    - Existence
    - Effectiveness
    - Freedom of action
    - Security
    - Adaptability
    - Coexistence
  - System determined**
    - Reproduction
    - Psychological needs
    - Responsibility
- c) Basic orientors (Bossel, 1999)
- d) Gibson et al. (2005) Sustainability Assessment Criteria
- Socio-ecological system integrity
  - Livelihood sufficiency opportunity
  - Intra and inter-generational equity
  - Precaution and adaptation
  - Resource maintenance & efficiency
  - Socio-ecological civility & democratic governance
  - Immediate and long term integration

# Review of Sustainability Assessments

Model used	Number of assessments using model	Stakeholder selected indicators	Integration of indicators
PSR/DPSIR	7 (2 incorporating 3 spheres model)	2	1
Three spheres/pillars and Triple-bottom-line	15	5	1
Prism of sustainability or four pillars	9 (4th pillar was institutional (5), wellbeing (1), natural resources (1), democracy (1), cultural (1))	5	2
Human-ecosystem linked	2	1	3
Basic orientors	4	1	0
Principles of sustainability	2	1	0
Systems analysis	2	1	0
Stakeholder defined issue/goal based	6	6	0
Issue/goal based	5	3	1
Policy themes	2	1	0

Which assessment provides the best information for decision makers?

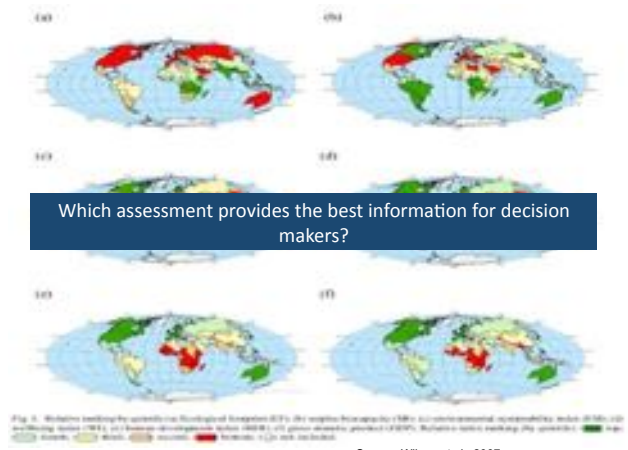


Fig. 6. Six maps showing the geographic distribution of the six regions from the six different sustainability models. (1) PSR, (2) DPSIR, (3) Triple-bottom-line, (4) Prism, (5) Basic orientors, (6) Stakeholder defined issue/goal based. Source: Wilson et al., 2007



## Sustainability Assessment for Governance

Need to link sustainability theory, stakeholder values and practice to provide:

- Legitimacy -> integrating stakeholder values
- Credibility -> embedded in theory
- Salience -> local context

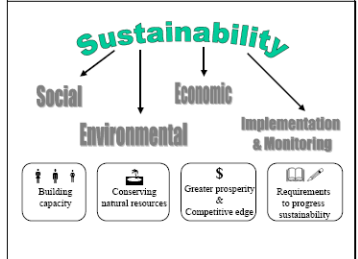
...and the best information for decision makers.

## South West Victoria



## Sustainability Assessment Development

Sustainability goals for South West Victoria (South West Sustainability Partnership, 2001):



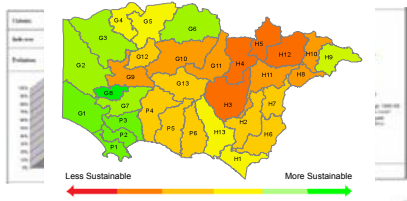


### Sustainability Assessment Development

Three stages of sustainability assessment development

1. Stakeholder indicator prioritisation
2. Data collection and collation -> Sustainability Report Cards
3. Multiple Criteria Analysis of Sustainability -> An Index of Regional Sustainability (AIRS)

AIRS GIS Assessment

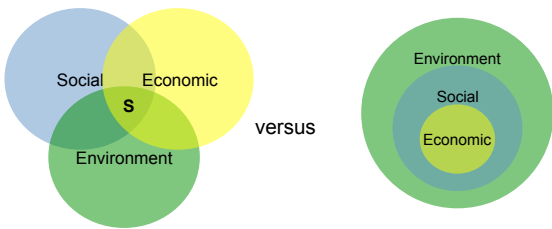


### Sustainability Assessment Development

Project stage	Sustainability Dimensions				
	Environmental	Social	Economic	Institutional	Total
Stakeholder priority indicators	55% (24)	16% (7)	18% (8)	11% (5)	100% (44)
Sustainability Report Cards	58% (11)	26% (5)	16% (3)	0% (0)	100% (19)
AIRS	54% (7)	23% (3)	23% (3)	0% (0)	100% (13)



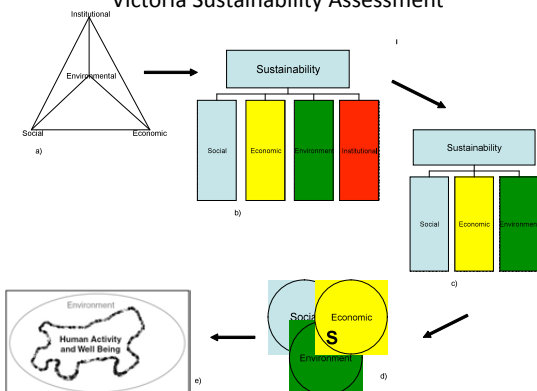
### Sustainability Assessment Development - AIRS



Which model most closely represented South West Victoria?

Pillar	Indicator	Sustainability Impact Rating		Equal three pillars model		Stand alone indicators model	
		SIR	Rank	Weight	Rank	Weight	Rank
Economic	Employment diversity	0.092	9	0.374	2	0.039	11
	Unemployment rate	0.085	10	0.325	3	0.046	9
	Weekly household income	0	13	0.302	5	0.061	8
<b>Total economic pillar weight</b>				<b>1.077</b>		<b>0.146</b>	
Social	Age structure diversity	0.093	8	0.511	1	0.043	10
	People completed Yr 12	0.074	11	0.170	10	0.029	12
	Population growth rate	0.069	12	0.319	4	0.028	13
<b>Total social pillar weight</b>				<b>1.000</b>		<b>0.090</b>	
Environment	Dryland salinity	0.279	1	0.249	7	0.118	2
	Remnant vegetation	0.275	2	0.242	8	0.113	3
	Dryland pasture	0.269	3	0.268	6	0.124	1
	Wind erosion	0.268	4	0.242	8	0.108	4
	Water erosion	0.203	5	-	-	0.093	7
	Soil structure decline	0.184	6	-	-	0.097	6
	Pine plantations	0.168	7	-	-	0.103	5
<b>Total environmental pillar weight</b>				<b>1.646</b>		<b>0.756</b>	

### Evolution of Sustainability Models for South West Victoria Sustainability Assessment



### Re-connecting Theory & Practice

- Sustainability theory provides models
- Stakeholders provide local context
- Indicator impact on sustainability & each other provide assessment of local sustainability

Together they...

Re-connect sustainability theory & practice

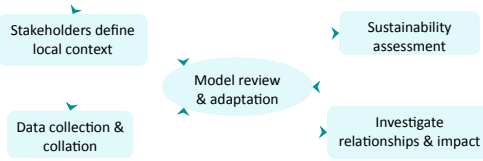
Produce an integrated assessment of sustainability

Give legitimacy, credibility and salience



# The Future of Sustainability Assessment

Iterative process...



Progress sustainability theory & practice & provide decision makers with the best information.



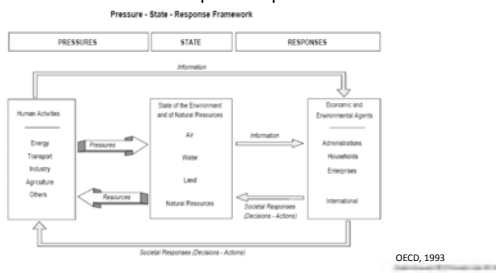
Thank you for your attention!  
Any questions?

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# Models of Sustainability

- Models developed to help frame sustainability
- Beginnings in environmental monitoring
  - Produced Pressure – State – Response frameworks
  - Drivers-Pressure-State-Impact-Response

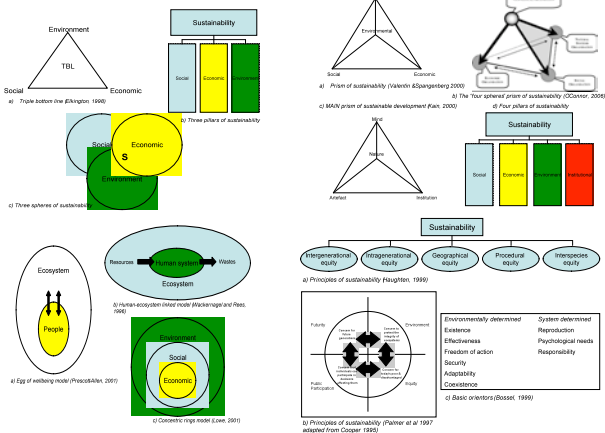


# Models of Sustainability

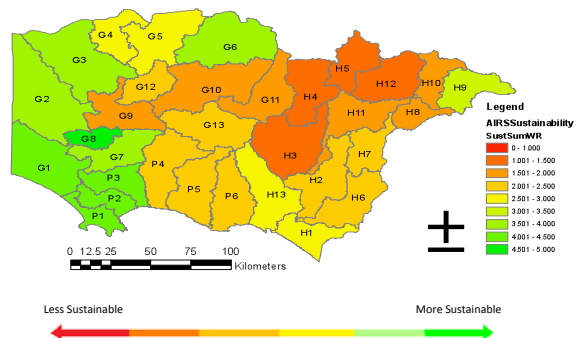
- Three mainstreams started to develop out of debate about what sustainability means...
  - Four dimensions of sustainability
  - Linked human - ecosystem
  - Principles of sustainability



# Models of Sustainability



# Emphasis on Environmental Sustainability





## What this means for management in South West Victoria...

- South West Victoria is an agricultural based economy
- Environmental condition impacts on agriculture
- To maintain social & economic capacity we must maintain biocapacity
- At the moment, environmental sustainability has to be the focus



## Systems Theory & Sustainability Assessment

- Sustainability is dependent on the whole system's viability
- Assess health & functioning of system's supporting elements
- For agricultural & natural resource based systems, environmental sustainability is the key

This suggests it is unlikely each sustainability dimension has equal importance...