A Transdisciplinary Approach to Integrated Resource Management:

A Pragmatic Application of Ecological Economics

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Dedication

I wish to dedicate this thesis to the two greatest loves in my life

my Lord, Jesus Christ

and my family Verity, Adrian, Katrina, Blair and Callum.

I trust their experience of the PhD 'journey' has not been too onerous

I thank them for standing with me throughout.

Abstract

This thesis reports how the best practice for dealing with complex environmental management problems has been advanced. This has resulted from the development of a series of tools that facilitate the use of participative decision making as an integrated part of the overall public decision making process. The methodological basis for these tools has been developed based on a synthesis of recent scholarship in the fields of ecological economics, systems theory, learning organisations, and the 'new sciences' of chaos and complexity. The case studies for this work were all related to the integrated management of catchments, and thus the findings are of direct relevance to practitioners in this area. As part of the research, some epistemological aspects of transdisciplinary research have been explored, and a number of indicators of transdisciplinarity identified. Following from this, a transdisciplinary methodology, Participative Environmental Management (PEM), has been articulated. PEM is a stakeholder driven, participative learning approach to complex anthropo-environmental problems such as are encountered within the general area of integrated resource management. PEM provides a structured approach so that effective integration across the social, economic and ecological dimensions of environmental problems can better be achieved than has been the case previously. As a fundamentally transdisciplinary approach, PEM has the potential to influence future theoretical and practical developments within the transdiscipline of ecological economics.

Certification

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree of qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

John Andrew James Wolfenden

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Glossary

AEAM	Adaptive Environmental Assessment and Management
ANZSEE	Australia New Zealand Society for Ecological Economics
BMP	Best Management Practice
CIRET	International Centre for Transdisciplinary Studies
CMC	Catchment Management Committee
CWMB	Catchment Water Management Board
CWPR	Centre for Water Policy Research
dt	A small time interval used in a system dynamics simulation model
epistemology	The branch of philosophy that investigates the origin, nature, methods, and limits of human knowledge
ESD	Ecological Sustainable Development
GIS	Geographic Information System
ICM	Integrated Catchment Management
IEM	Integrated Environmental Management
IRM	Integrated Resource Management
ISEE	International Society for Ecological Economics
ithink	A system dynamics systems mapping and simulation software package
Landcare	A landholder-based movement in Australia involving Federal funding and local organisations to remediate degraded land
LEAP	Local Environment Agency Plan (UK)
learning organisation theory	A contemporary approach to business management generally attributed to Peter Senge of MIT
LPLMC	Liverpool Plains Land Management Committee
methodology	The science of method – in particular a systematic approach based on an articulated epistemology and a set of identified methods that are consistent with that epistemology

NSESD	National Strategy for Ecologically Sustainable Development (Australia)
PEM	Participative Environmental Management
PRA	Participative Rural Appraisal
Powersim	A system dynamics systems mapping and simulation software package
RRA	Rapid Rural Appraisal
SWOT	Strengths, Weaknesses, Opportunities and Threats (a critical review framework)
system dynamics	A discipline specialising in understanding feedback loops and non-linear relationships in systems
TCM	Total Catchment Management (New South Wales)
transdisciplinary	An approach to intellectual investigation in which there is an intentional holistic problem focus consistent with identifying synergy. It requires the transcendence of existing disciplinary boundaries.
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable Development
UNEP	United Nations Environment Program
Vensim	A system dynamics systems mapping and simulation software package
WCED	World Commission on Environment and Development