

**Opportunities for, and Impediments to,
Natural Resource Governance Innovation
Illustrated by the Biofuels Weed Risk
Case Study**

by

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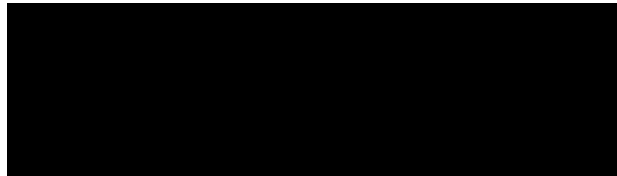
October 2012

CANDIDATE'S 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 or qualification.

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

I declare that to the best of my knowledge and belief the law as stated in this thesis is current until 19 October 2012.



Elodie Jeanine Le Gal

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ABSTRACT

This thesis is about innovation in natural resource governance. Established NRM models in either their command-and-control or deregulated market-based forms insufficiently achieve sustainable environmental outcomes and thus legal innovations are needed for protecting environmental values. Environmental law scholarship is mostly informed by a research paradigm which focuses upon individual instruments for environmental protection. By considering the broader governance system in which environmental and NRM governance models operate, this thesis argues that it is possible to:

- (i) design innovative environmental governance systems that can (in theory) better protect environmental values;
- (ii) mitigate the risks associated with innovative governance systems by better identifying them.

However, the theoretical potential of policy innovation does not necessarily translate into feasibility. The second contribution of this research is to provide insights into the types of impediments that may inhibit practical implementation of innovative legal approaches.

By using a pragmatic approach, this research aims to propose practical policy solutions to manage anthropogenic risks to environmental values and provide insights into theoretical tools to address NRM issues. This is illustrated with a case study focusing on the biofuel weed risk. While second-generation biofuel crops may produce bio-ethanol, help achieve a clean energy future, and help find the right balance between energy and food production, their use could also result in catastrophic biological infestations that may harm biodiversity values.

The first part of this thesis provides an overview of the research and its broader implications. It also contextualises the research project in its methodological foundations.

The second part of this thesis discusses concepts for innovations in natural resources risk management. This includes informing instrument design with commercial risk instruments by taking a transacting systems approach, using co-regulation and adopting a 'smart' 'responsive' design institutional approach. The resulting conceptual model for biofuel weed risk control is designed to maximise the opportunities associated with second-generation biofuel crops while minimising the risks attached to them.

The third part of this thesis demonstrates that, in practice, natural resource governance innovation will be limited by institutional and political challenges. These are identified through an in-depth interview process, and by combining three non-legal theoretical tools (theory of path dependence, the theory of transaction costs and public choice theory). Additional jurisprudential, methodological and cultural challenges are also identified. The research suggests that the underpinning research program required for more effective environmental law reform is likely to be vast, daunting but intellectually stimulating.

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LIST OF ABBREVIATIONS

CLC	International Convention of Civil Liability for Oil Pollution Damage
COFR	Certificate of Financial Responsibility
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPPRD	Emergency Plant Pest Response Deed
ESD	Ecologically Sustainable Development
GHG	Greenhouse Gas
FAO	Food and Agricultural Association
FRM	Financial Responsibility Mechanism
IGAE	Intergovernmental Agreement on the Environment
ILS	Insurance Linked Securities
IOPC	International Oil Pollution Compensation
IUCN	International Union for Conservation of Nature
NPFC	National Pollution Funds Centre
NRM	Natural Resource Management
NSEDS	National Strategy for Ecologically Sustainable Development
OECD	Organisation for Economic Co-operation and Development
R and D (R&D)	Research and Development
RET	Renewable Energy Target
RP	Responsible Party
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SD	Sustainable Development
SRI	Socially Responsible Investment
WoNS	Weeds of National Significance

THE ARRANGEMENT OF CONTENT

This thesis consists mainly of stand-alone journal papers and book chapters. Each deals with a different aspect of the thesis content but inevitably there is some repetition of content. In essence the content comprises three parts, made up of articles and book chapters with supplemental exegesis (made up of additional explanatory or conceptual material that forms part of the research but which has not been authored as stand-alone publications). The arrangement is thus:

Part 1: Overview of the research and its broader implications

This part consists of introductory explanatory material, and two publications. The purpose of the first paper, ‘Biofuels Governance: Insufficient Legal Instruments or Innovative International Governance?’ and exegesis is to give the examiner an over-arching perspective on the purpose, approach to and implications of the research. The second paper, ‘Methodological Approach for Testing a Co-regulatory Bio-fuels Weeds Risk Management Model’, returns to the basics of the research itself, providing a detailed discussion of the initial methodology for the PhD.

Part 2: Innovations in the design of a new co-regulatory approach

This part is built around the paper ‘Concepts for Industry Co-Regulation of Bio-fuel Weeds’, which provides a highly abbreviated discussion of a sophisticated approach that relies heavily upon concepts drawn from economics, institutional theory and commercial risk management science. Anticipating that the examiners will largely be aware of mainstream regulatory and market instrument developments but not some of the highly specialised concepts, a detailed exegesis of these concepts is provided. The exegesis is somewhat expansive on the risk topic because this is the most conceptually challenging aspect of the innovative approaches this thesis utilises.

Part 3: Exploration of the implementation and feasibility of risk governance innovations

This part of the thesis turns from consideration of possible design concepts and innovative strategies towards developing a structured understanding of

impediments to major innovation. The focus is upon using the conceptual model developed in Part 2 as the basis for ‘teasing out’ challenges to any such innovations through depth interviews with a variety of specialists. The overall outcomes of this exploration were discussed in Part 1, in the first publication. However in Part 3 both the interview results and the theoretical aspects of these are developed further.

This part is built around two main papers. The first one ‘The Effects of Institutional Path Dependence, Political Dynamics and Transaction Costs on the Potential for “smart” Regulatory Innovation: An Illustration with the Biofuel Weed Risk Case Study’ discusses the institutional and political impediments to the adoption of an innovative approach for biofuel weed risk governance. A longer version of this article is incorporated into the body of this thesis. The journal article is in appendix 1. The second journal article ‘The Challenges of Implementing Legal and Regulatory Innovations for Protecting Environmental Values’ highlights the broader institutional, political, jurisprudential and cultural impediments to legal and regulatory innovations in the field of natural resource management. The conclusive chapter restates the key findings of this research project, discusses research implications and provides further research directions.

EXPLANATION: UNIVERSITY RULES OF PHD THESIS IN THE FORM OF PUBLICATIONS

The rules for a PhD thesis in the form of publications are available at <http://www.une.edu.au/research-services/forms/hdr.php> (under 'journal-article-format for PhD theses at UNE'). In essence, under these rules, a candidate may present their thesis wholly or partly in the form of (no less than three) publications. These may be already published, accepted for publication, submitted or in draft. Two publications within this thesis have been published and two are submitted.

It is permissible for the publications to be co-authored. Within this thesis two of the publications have been co-authored with the candidate's principal supervisor, Professor Paul Martin. In each case, a formal statement of authorship is provided.

In general, the contribution of Professor Martin has been to providing the broader framework within which to understand the issues of biofuels and weed issues. The substantial part of the literature research in both papers has been carried out by the candidate. Early in the process of developing the research, Professor Martin was also responsible for introducing the candidate to many of the fundamental concepts of regulatory innovation. In each of the two co-authored papers, the designated split of intellectual contribution is 50 per cent, with Professor Martin's contribution being the broader framing of the issues to supplement the candidates more specialised research discussion.